Wet-Set
ADA COMPLIANT • DURABLE • REPLACEABLE

TufTile’s 140,000 sq. ft. manufacturing and distribution facility is located in Lake Zurich, IL.

www.TufTile.com
CAST IRON TILES
WET-SET

Tiles shipped with anchors installed

Wet-Set Tiles

Great for use in areas where heavy tile abuse is possible including areas subject to snowplowing.

Durable rust resistant finish on all tile color options.

Durable solid cast iron construction complies with “Buy American” domestic content requirements.

ADA compliant wet & dry slip-resistant surface.

Cast iron wet-set tiles are for new construction.

Unique “umbrella” style anchors lock tile securely into concrete without displacing aggregate.

Uniform tile underside eliminates trapping air during installation.

TUFTILE® TACTILE IS ADAAG / PROWAG / CA TITLE 24 COMPLIANT

PAT. NO. US D691,743 S

1-888-960-8897
CAST IRON TILES
Durable Cast Iron complies with “Buy America” domestic content requirement
WET-SET (REUSABLE)

- Stainless steel tamper-resistant 1-1/2” screw
- Self-threading corrosion-resistant composite anchors
- Protective sheeting ensures installation cleanliness
- Bilingual installation instructions are attached to each tile
- Cast in TufTile identification
- Made in USA

CAST IRON COLORS
- Powder coat color includes zinc-rich epoxy primer base and durable UV resistant finish.
- PATINA (No Finish)
- COLONIAL RED (Color I.D. CRD)
- YELLOW (Color I.D. YEL)
- BLACK (Color I.D. BLK)
- BRICK RED (Color I.D. BLD)
- DARK GRAY (Color I.D. GRY)

CAST IRON RADIUS TILES
Radius Wedge colors match corresponding Cast Iron tiles
- Wedges are sized per the radius of the arc.
- Made in USA
- 25 ft. wedge radius example for 14.1 effective radius with 2’x1’ panels

CAST IN TUF_TILE IDENTIFICATION

WEDGES ARE SIZED PER THE RADIUS OF THE ARC.

EFFECTIVE RADIUS SIZES

<table>
<thead>
<tr>
<th>Wedge</th>
<th>Weight</th>
<th>Radius with 2’ x 2’ Panels</th>
<th>with 2’ x 1’ Panels</th>
</tr>
</thead>
<tbody>
<tr>
<td>15R</td>
<td>11.8 lbs</td>
<td>15 Foot 15 Foot Radius</td>
<td>8.8 Foot Radius</td>
</tr>
<tr>
<td>20R</td>
<td>10.5 lbs</td>
<td>20 Foot 20 Foot Radius</td>
<td>11.1 Foot Radius</td>
</tr>
<tr>
<td>25R</td>
<td>9.3 lbs</td>
<td>25 Foot 25 Foot Radius</td>
<td>14.1 Foot Radius</td>
</tr>
<tr>
<td>30R</td>
<td>8.5 lbs</td>
<td>30 Foot 30 Foot Radius</td>
<td>16.8 Foot Radius</td>
</tr>
</tbody>
</table>

TufTile® ADA Tiles have a 5-Year Limited Warranty – see website or contact customer service.

TUFTILE® TACTILE IS ADAAG / PROWAG / CA TITLE 24 COMPLIANT
PAT. NO. US D691,743 S

TufTile.com 1-888-960-8897
Cast Iron Packaging Design

Packaged 26 per skid. With anchor supports between each panel.

Panels come with bi-lingual installation instructions and protective sheeting on each tile.

Corner blocking protects the outside edges from damage during shipping.

Skid and panels are wrapped in protective film with label affixed to the side.

**TufTile®**

**ADA TACTILE (CAST IRON) PRODUCTS**

**WET-SET**

- x 24” x 24”
- 24” x 30”
- Brick Red
- Colonial Red
- Yellow
- Black
- Patina (natural)
- Dark Gray

**Cast Iron Panels packaged:**

<table>
<thead>
<tr>
<th>Panel Size</th>
<th>24”x12”</th>
<th>24”x24”</th>
<th>24”x30”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units/Skid</td>
<td>52</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>Weight</td>
<td>1023</td>
<td>1023</td>
<td>1270</td>
</tr>
<tr>
<td>Dimensions</td>
<td>26”x49”</td>
<td>26”x49”</td>
<td>32”x49”</td>
</tr>
</tbody>
</table>

1-888-960-8897
TufTile.com
TufTile® ADA DETECTABLE WARNING PRODUCTS

TufTile Radius Calculator

- Feet/inches
- Metric
- Polymer
- Cast Iron

Radius Length: 0.00 feet
- Have Radius
- Have Height

Chord Length: 0.00 feet
- Have Chord Length
- Have Arc Length

ARC Length

Recommended Tile Size
Recommended Wedge Size

Quantity
Quantity

Enter values in the 2 fields provided (Radius Length and Chord Length) then click the 'Calculate' button to create the estimate for your Radius installation. You can enter the Height or Rise in lieu of the Radius Length. Arc Length can be used as an alternative to the Chord as well. The recommended Tile Size, Wedge Size and their respective Quantities will display in the space provided.

The Metric option will expect the lengths to be entered in Meters.

Polymer vs Cast Iron will make use of the 24"x36" tiles or 24"x30" respectively as required.

The values 'arc length', 'segment length', 'arc overrun' and 'variance' are informational.

Arc Length is calculated when the chord length is given. Segment Length is known by adding the top edge lengths of 1 selected Tile and Wedge. Arc overrun is the remainder when the Arc Length is different than the sum of the Tiles and Wedges. Variance occurs when the Radius calculated is different than the Radius made from the suggested components. The variance amount is the distance between those two values.

The size change warning line will display when the program calculates an 'Arc overrun' that is negative. In the case when a smaller tile will leave less extra radius it recommends that instead of just adding another equal width tile. So if the job calls for 7 24"x24" tiles and 7 wedges and it leaves less than 14 inches of remaining radius, it tells the user to order 1 24"x12" tile instead of another 24"x24". The same goes for 30" and 36" wide tiles where it can substitute a 24"x12" or 24"x24" as required. This is only a suggested solution.

Our Radius calculator is provided as a reference to help you estimate the amount of material you need for your project. This calculator provides an ESTIMATE.

Coverage is affected by a number of factors. In order for us to ensure that you have adequate material for your job, please round up to the nearest foot.
CAST IRON DETECTABLE WARNING TILE
24" X 12" WET SET
2.350 DOME SPACING
(REUSEABLE)

TUFTEIL
1200 Flex Court
Lake Zurich, IL 60047
1-888-960-8897
www.tuftile.com
24” X 24” WET SET
(Reusable)

CAST IRON DETECTABLE WARNING TILE
2.350 DOME SPACING

TEL 888-960-8897     FAX 847-550-8004     www.tuftile.com
24” X 30” WET SET  
CAST IRON DETECTABLE WARNING TILE  
2.350 DOME SPACING  
(REUSEABLE)
Sample Radius Drawings with 2’ x 2’ tiles and 2’ x 1’ tiles
Sample Radius Drawings with 2’ x 2’ tiles and 2’ x 1’ tiles

25R WEDGES - 24” X 12” & 24” X 24” TILES

30R WEDGES - 24” X 12” & 24” X 24” TILES
15' WET SET

CAST IRON DETECTABLE WARNING
RADIUS—WEDGE TILE

(REUSEABLE)

TEL 888-960-8897     FAX 847-550-8004     www.tuftile.com
20' WET SET
CAST IRON DETECTABLE WARNING
RADIUS—WEDGE TILE
(REUSEABLE)

TEL 888-960-8897     FAX 847-550-8004     www.tuftile.com
25’ WET SET
(USEABLE)

CAST IRON DETECTABLE WARNING RADIUS—WEDGE TILE

TEL 888-960-8897  FAX 847-550-8004  www.tuftile.com
July 26, 2017

TUF-TITE, INC.
INPRES, INC.
TUFTILE, INC.
1200 Flex Court
Lake Zurich, IL 60047

RE: Waupaca’s Certification for Buy America Act.

Ted Meyers

All castings produced by Waupaca Foundry, Inc. for Tuf-tite Inc. are MELTED, POURED, AND MANUFACTURED EXCLUSIVELY at one of our six facilities located in Waupaca and Marinette, Wisconsin, Tell City, Indiana, or Etowah, Tennessee. Under the various “Buy American” definitions, the following are those that we comply with:

- American Recovery and Reinvestment Act of 2009, Section 1605 – Buy America
- Federal Aviation Administration, 49 U.S.C. § 50101
- Federal Highway Administration, 23 U.S.C. § 313 – Buy America; 23 C.F.R. § 635.410
- Federal Transit Administration, 49 U.S.C. § 5323(j); 49 C.F.R. Part 661

Please do not hesitate to contact us at any time with any questions or concerns that you may have.

Thank you,

Darrell Oligney

Senior Customer Service Manager
**TufTile® INSTALLATION INSTRUCTIONS**

**WET-SET (REPLACEABLE)**


2. The concrete physical properties need to comply with the project’s specifications. The proper slump range will ensure TufTiles maintain a solid connection with the cured concrete.

3. For Radius or Connected Tiles, see below. For normal tile install, do not remove protective plastic covering from TufTile until it’s installed and concrete is fully cured.

4. Slowly press the TufTile into the wet concrete until the base of the truncated domes is flush with the concrete. *(Figure 1)* Do not stand on the tile during installation. *(TufTile)* polymer products are not recommended for asphalt installations.

5. To ensure proper integration between TufTile WS anchors, *Concrete Keepers™*, and the concrete it is important to tap the entire TufTile surface with a rubber mallet. *(Figure 2)* *Concrete Keepers™* are a feature of TufTile polymer products only.

6. OPTIONAL: In drier or wetter concrete mixes a weight like a sand bag or block may be laid on top of the installed tile to hold the tile at the desired depth and prevent it from “floating” during the curing process. *(Figure 3)*

7. IMPORTANT! WHILE THE CONCRETE IS WORKABLE, AN 1/8” DEEP TROW- ELED EDGE MUST BE INSTALLED AROUND THE TILE PERIMETER. *(Fig. 4)*

8. Finish the concrete as required in the specifications. Do not stand or walk on the TufTile until the concrete is fully cured.

9. Remove protective plastic sheeting after all post-installation treatments are complete and the concrete has cured. TufTile’s protective film does not wrap under the tile and can be fully removed. Your TufTile installation is now complete.

---

### Radius or Connected TufTile® Installation

**Instead of Step 3 above, do the following:**

3. Peel back the protective coating on the tile edges.

3a. Remove anchors from edges that join.

3b. Insert Radius or Connector part between the tiles.

3c. Re-install anchors through tile and Radius or Connector.

3d. Locate the complete surface in position over wet concrete

**Resume installation at Step 4 above**

Additional installation information including an installation tutorial is available at

[www.TufTile.com](http://www.TufTile.com)

If you have any additional questions please contact TufTile®

Thank you for your business!

1-888-960-8897

[www.TufTile.com](http://www.TufTile.com)
**TufTile® INSTRUCCIONES DE APLICACIÓN**

**HÚMEDO-SET (REEMPLAZABLE)**


2. Las propiedades físicas del concreto deben cumplir con las especificaciones del proyecto. El rango de asentamiento adecuado asegurará TufTiles mantener una sólida conexión con el concreto curado.

3. Para radio o azulejos conectados, ver abajo. Para baldosas de instalación normal, no retire la cubierta plástica protectora de TufTile hasta que esté instalado y el hormigón esté completamente curado.

4. Con cuidado presione el TufTile en el concreto húmedo hasta que la base de las cúpulas truncadas quede al nivel con el concreto adyacente. *(Figura 1)* No se pare sobre la baldosa durante la instalación.

5. Para asegurar una adecuada integración entre anclajes TufTile WS,*Concrete Keepers™* y lo concreto es importante pulsar toda la superficie TufTile con un mazo de goma. *(Figura 2)* *Concrete Keepers™* son una característica de sólo productos del almidón de TufTile.

6. Opcional: En mezclas secas o más húmedas un peso como una bolsa de arena o bloques puede colocarse en la parte superior de la baldosa instalada para mantener a la profundidad deseada y prevención flotante que forman mientras que el cemento se en durece y se cura. *(Figura 3)*

7. **IMPORTANTE!** MIENTRAS EL CONCRETO SE PUEDA TRABAJAR, DEBERÁ UTILIZAR Y DESLIZAR UNA HERRAMIENTA LLANA DE 1/8 “ PARA HACER UN BORDE ALREDEDOR DEL PERÍMETRO DEL BALDOSA. *(Figura 4)*

8. Termine el concreto como se requiere en las especificaciones. No se pare ni camine sobre el TufTile hasta que el concreto esté completamente curado.

9. La cubierta de plástico protectora se puede retirar después de todos los tratamientos de concreto instalación este completa y el este curado. La lámina protectora del TufTile no se ajusta bajo la baldosas y se puede quitar totalmente. Su instalación se ha completado.

---

**Instalación de radio o conectados TufTile®**

En lugar de paso 3, haga lo siguiente:

3. Remueva la capa protectora en los bordes de los azulejos.

3a. Retire los anclajes de los bordes que se unen.

3b. Asemble el conector o al radio entre los TufTiles.

3c. Volver a instalar los anclajes a través de baldosas y Radio o Conector.

3d. Localice la superficie montaje completa en posición sobre el hormigón húmedo.

Reanudar la instalación en el paso 4 anterior

Información adicional de instalación que incluye un tutorial de instalación está disponible en [www.TufTile.com](http://www.TufTile.com)

Si usted tiene alguna pregunta adicional, por favor, póngase en contacto con TufTile®.

Gracias por su preferencia!

1-888-960-8897

[www.TufTile.com](http://www.TufTile.com)
MATERIAL SAFETY DATA SHEET (MSDS)

**SECTION I: MATERIAL IDENTIFICATION**

**CHEMICAL FAMILY:** Iron (Fe)

**MANUFACTURER:** Thyssen Krupp-Waupaca, Inc. Waupaca, WI 54981

**CONTACT INFORMATION:**

TufTile™ 1200 Flex Court, Lake Zurich, IL 60047
Ph: (888) 960-8897

**SECTION II: COMPOSITION/INFORMATION ON INGREDIENTS**

**Hazardous Components:** None in solid form

**Composition:** Carbon (C), Chromium (Cr), Copper (Cu), Iron (Fe), Nickel (Ni), Silicon (Si), Tin (Sn)

**Melting Temperature:** 2350 Degrees Fahrenheit

**SECTION III: PHYSICAL CHARACTERISTICS**

**Emergency Overview:** This material is NOT HAZARDOUS by OSHA Hazard

**Appearance and Odor:** Solid Mass, No Odor

**Specific Gravity:** 7.86

**Freezing Point:** N/A

**Solubility in Water:** Insoluble

**% Volatile by Volume:** N/A

**Boiling Point:** 5000F

**pH:** N/A

**SECTION IV: FIRE AND EXPLOSION INFORMATION**

**Flammability:** Not Flammable

**Means of Extinction:** N/A

**Special Procedures:** None

**Explosion Data:** None Known

**Sensitivity of Mechanical impact:** None

**Hazardous Combustion:** None Known

**Auto ignition Temp:** N/A

**Sensitivity to Static:** N/A

**SECTION V: HEALTH HAZARD DATA**

**Permissible Exposure:** N/A for product (See Section II above)

**SECTION VI: REACTIVITY DATA**

**Chemical Stability:** Yes

**Reactivity:** N/A

**SECTION VII: SPILL OR LEAK PROCEDURES**

**Spill:** None (Solid Mass Product)

**Waste Disposal:** Recover or Recycle if possible

**SECTION VIII: PROTECTIVE EQUIPMENT TO BE USED:**

**Protective Gloves:** Wear resistant gloves

**Eye Protection:** Wear safety glasses with side shields

**SECTION IX: LEGAL DISCLAIMER**

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.™
PHYSICAL CHARACTERISTICS – CAST IRON

**DOME GEOMETRY**

ADA (R305.1.1) specifies truncated domes shall have a base diameter of 0.9" minimum, a top diameter of 50% of the base diameter minimum, and a height of 0.2".

![Dome Geometry Diagram]

**DOME SPACING**

ADA (R305.1.2) specifies truncated domes shall have a center-center of 1.6" to 2.4"

![Dome Spacing Diagram]

**CAST IRON WET-SET**

Material – Gray Iron

<table>
<thead>
<tr>
<th>Material Standard</th>
<th>Property</th>
<th>Dry-948</th>
<th>Wet-1.099</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM C 1028</td>
<td>Slip Resistance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASTM A 48</td>
<td>Tensile Strength</td>
<td>35,900 psi</td>
<td></td>
</tr>
<tr>
<td>ASTM C 501-84</td>
<td>Abrasion Resistance</td>
<td>88 (lower number = better wear properties)</td>
<td></td>
</tr>
<tr>
<td>ASTM D 695</td>
<td>Compressive Strength</td>
<td>81,700 psi</td>
<td></td>
</tr>
<tr>
<td>NCHRP Procedure T4-33</td>
<td>Impact Resistance</td>
<td></td>
<td>No substantial damage</td>
</tr>
</tbody>
</table>
Waupaca Foundry

PLANT 23 LAB ANALYSIS REPORT

CUSTOMER: TUFTILE INC., 1200 Flex Ct., Lake Zurich, IL 60047

PART NUMBER: 2X2 TILE
REV. MODEL: GRAY CAST IRON

MATERIAL SPECIFICATION: HB SPEC. 101/302
CAST DATE: 7/10/2013

LAB ID: 2312
REPORT DATE: 7/11/2013

PART NAME: ADA TILE

REASON FOR REPORT:
SAMPLE - NEW TOOLING: PATTERN #1, CAVITY #1

CHEMISTRY:

<table>
<thead>
<tr>
<th>C.E.</th>
<th>C</th>
<th>Si</th>
<th>Mn</th>
<th>P</th>
<th>S</th>
<th>Ni</th>
<th>Mo</th>
<th>Cr</th>
<th>Cu</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.16</td>
<td>3.45</td>
<td>2.14</td>
<td>0.03</td>
<td>0.029</td>
<td>0.076</td>
<td>0.06</td>
<td>0.03</td>
<td>0.18</td>
<td>0.20</td>
</tr>
<tr>
<td>Al</td>
<td>Ti</td>
<td>Sn</td>
<td>Mg</td>
<td>V</td>
<td>Sb</td>
<td>Pb</td>
<td>C</td>
<td>Zn</td>
<td></td>
</tr>
<tr>
<td>0.003</td>
<td>0.011</td>
<td>0.018</td>
<td>0.000</td>
<td>0.010</td>
<td>0.009</td>
<td>0.001</td>
<td>0.000</td>
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</tr>
</tbody>
</table>

MECHANICAL PROPERTIES:

<table>
<thead>
<tr>
<th>RESULTS FROM...</th>
<th>TENSILE STRENGTH</th>
<th>BRINELL HARDNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DIA. (&quot;&quot;)</td>
<td>PSI</td>
</tr>
<tr>
<td>ASTM A48 A-BAR</td>
<td>0.498</td>
<td>35,300</td>
</tr>
<tr>
<td>CASTING: BRINELL ONLY</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

COMMENTS:

MEETS CUSTOMER MATERIAL SPECIFICATION

ACTION:

APPROVED FOR PRODUCTION

SUBMITTED BY: KEVIN M. KUEHL

Waupaca Foundry
1003 Shaler Drive, P.O. Box 369
Waupaca, WI 54981
Telephone: 715.258.4611 Fax: 715.258.6300

TufTile® ADA DETECTABLE WARNING PRODUCTS
1200 Flex Court, Lake Zurich, IL 60047
1-888-960-8897
TufTile.com
TufTile Inc.
1200 Flex Court
Lake Zurich, IL 60047

Attention: Mr. Ted Meyers
Regarding: Physical Testing of Cast Iron Tiles
Gaynes Job No. 13505-1 TufTile P.O. 11552

Dear Mr. Meyers

Please find below, the procedures and results of the tests that were conducted on a cast iron tile submitted and identified by TufTile, Inc.

TEST PROCEDURE:

ASTM C1028 Slip Resistance (static coefficient of friction)

Testing was not conducted in strict accordance with ASTM C1028 procedures. Typically, the tiles to be tested are a smooth hard surface. The material submitted has a symmetrical pattern of domes covering the surface. The domes are spaced 2" apart (o.c.) and are 0.65" in diameter at the flat top and are raised 0.2" above the surface of the tile. The entire surface including the domes are covered with pointed nubs, approximately 0.039" high. There are 13 nubs on each dome. See Photo No. 1 for a Close-up of the domes and nubs.

TufTile, Inc. supplied the material to be pulled across the surface of the tile. That is: medium strength neoprene, plain black rubber (60A durometer), 3/32" thick procured from McMaster-Carr supply company. The neoprene was used for testing as received (no conditioning or pre-treatment). A 6" x 6" piece of neoprene was then attached to a smooth flat hard surfaced pulling plate

The tile to be tested was secured in a horizontal position. The pulling plate was placed on top of the tile so that the neoprene covered 9 domes. A 50 lb. weight was placed on top of the pulling plate. An electronic force-measuring instrument was attached to the pulling plate. The plate was manually pulled in a horizontal plane until the plate began to move across the tile surface. The initial pulling force was recorded in each of four pulls (N, S, E & W). The average pulling force was divided by the total mass acting on the neoprene to determine the static coefficient of friction. The procedure was conducted with the tile and neoprene dry and wet with tap water. See Photo No. 2 for an overview of the test setup.

TEST RESULTS:

Dry Static Coefficient of Friction: 0.948

Wet Static Coefficient of Friction: 1.099
Photo No. 1 – Close-up of Domes and Pointed Nubs

Photo No. 2 – Overview of the Test Setup
GENERAL STATEMENT COVERING THIS REPORT:

This report is submitted for the exclusive use of TufTile, Inc.. Its significance is subject to the representative nature of the samples submitted and the tests and examinations made. No quotations from this report or use of the Gaynes Labs, Incorporated name is permitted except as expressly authorized by Gaynes Labs, Incorporated in writing.

Gaynes Labs, Incorporated assumes no responsibility for the result of the observance or non-observance by TufTile, Inc. of the product standard contained in this report or upon the relations between TufTile, Inc. and any party or parties arising out of the sale or use of the product or otherwise.

TufTile, Inc. shall indemnify and hold harmless Gaynes Labs, Incorporated its employees and agents from any and all claims, demands, actions, and costs that may arise out of:

(a) Any dangerous defect or content in the item being tested, whether apparent or not, which dangerous defect or content was not disclosed in writing to Gaynes Labs, Incorporated by TufTile, Inc. at the time the item was submitted for testing;

(b) Differences between those items actually tested and items previously or subsequently produced which are purported to be identical to the item tested;

(c) Any use of the tested item, whether by TufTile, Inc. or a third party, following its return to TufTile, Inc. from Gaynes Labs, Incorporated.

Please contact me if you have any questions regarding this test program.

Report Prepared By: Andy Boersema
IDENTIFICATION: Three (3) Umbrella Anchors  
Mfg: Tuf-Tite, Inc.

TEST PROCEDURE: Determine maximum pull-out strength of anchor screw in shank by means of supporting top of anchor and apply vertical pulling force on screw load was applied using a Universal Test Machine (UTM) certified accuracy +/-1%.

TEST RESULTS:

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Ultimate Load (lbs.)</th>
<th>Failure Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>314.3</td>
<td>Umbrella pulled off shank</td>
</tr>
<tr>
<td>2</td>
<td>324.2</td>
<td>Shank deformed around umbrella</td>
</tr>
<tr>
<td>3</td>
<td>310.3</td>
<td>Umbrella pulled off shank</td>
</tr>
<tr>
<td>Average</td>
<td>316.2</td>
<td></td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>5.75</td>
<td></td>
</tr>
</tbody>
</table>

This report applies only to the actual samples tested. Northwest Laboratories does not certify, warrant, or guarantee any products manufactured by others. Samples discarded within thirty (30) days unless otherwise requested in writing by you.

NORTHWEST LABORATORIES, INC.

Richard J. Schefsky II  
Technical Manager

nbe

www.nwlabs1896.com  
rich2@nwlabs1896.com
TufTile Inc.
1200 Flex Court
Lake Zurich, IL. 60047

Attention: Mr. Ted Meyers
Regarding: Taber Abrasion Testing of Cast Iron Tile

Dear Mr. Meyers,

Please find below the procedures and results of the test that was conducted on Cast Iron ADA Tactile Warning Tile submitted and identified by TufTile Inc.

TEST PROCEDURE:

Testing was conducted in accordance with ASTM C501-84 (2009) Standard Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser. Testing was begun by weighing the test specimen to the nearest 0.01 gram. The sample was secured to the spindle of the Taber abrasion machine so that the smooth, non-nub side of the tile was subjected to the abrasion test. The abrasion machine was equipped with H-22 coarse Calibrade wheels. A 1 kg load was applied to each abrasive wheel. The machine was activated and allowed to run for 1000 cycles. The test specimen was removed from the spindle and reweighed. The abrasive wear index ($I_w$) is calculated using the following equation: $I_w = 88/(W_o-W_f)$ where $W_o$ is the original weight of the specimen, and $W_f$ is the final weight of the specimen.

TEST RESULTS:

Abrasive Wear Index = 88

Please contact me if you have any questions regarding this test program.

Report Prepared By: Andy Boersema
Photo No. 1 - Specimen After 1000 Test Cycles
GENERAL STATEMENT COVERING THIS REPORT:

This report is submitted for the exclusive use of TufTile, Inc.. Its significance is subject to the representative nature of the samples submitted and the tests and examinations made. No quotations from this report or use of the Gaynes Labs, Incorporated name is permitted except as expressly authorized by Gaynes Labs, Incorporated in writing.

Gaynes Labs, Incorporated assumes no responsibility for the result of the observance or non-observance by TufTile, Inc. of the product standard contained in this report or upon the relations between TufTile, Inc. and any party or parties arising out of the sale or use of the product or otherwise.

TufTile, Inc. shall indemnify and hold harmless Gaynes Labs, Incorporated its employees and agents from any and all claims, demands, actions, and costs that may arise out of:

(a) Any dangerous defect or content in the item being tested, whether apparent or not, which dangerous defect or content was not disclosed in writing to Gaynes Labs, Incorporated by TufTile, Inc. at the time the item was submitted for testing;

(b) Differences between those items actually tested and items previously or subsequently produced that are purported to be identical to the item tested;

(c) Any use of the tested item, whether by TufTile, Inc. or a third party, following its return to TufTile, Inc. from Gaynes Labs, Incorporated.

Gaynes Labs, Inc.

Yury Beyderman
CONTAINER-QUINN TESTING LABS
170 Shepard Avenue, Wheeling, IL 60090
Phone: 847-537-9470
E-Mail: spowell@container-quinn.com

TEST CONDUCTED FOR: Tuftile, Inc
1200 Flex Court
Lake Zurich, IL 60047
Attn.: Ted Meyers
866-960-8697

ITEMS TESTED: One (1) sample ADA Tactile Warning Pads made with Cast Iron

OBJECT OF TEST: To determine the Compressive Strength of the pads, PSI load

TEST PROCEDURE: Testing conducted in accordance with ASTM D-695

FINDINGS: These pads, as submitted and tested, were considered to comply with acceptance criteria.

See attached Laboratory Data Sheets for detailed test results

CONTAINER-QUINN TESTING LABS

APPROVED BY:

Stephen C. Powell - Vice-President

AS A MUTUAL PROTECTION FOR OUR CLIENTS AND OURSELVES, ALL REPORTS ARE SUBMITTED AS THE CONFIDENTIAL PROPERTY OF OUR CLIENTS, AND AUTHORIZATION FOR PUBLICATION IS RESERVED PENDING WRITTEN APPROVAL. SAMPLES WILL BE DISPOSED OF 30 DAYS AFTER TESTING IS COMPLETED UNLESS OTHER ARRANGEMENTS ARE AGREED TO IN WRITING.
TESTING RESULTS

COMPRESSION RESULTS
(ksi)

Actual: 81700
Dear Mr. Meyers,

Please find below the procedures and results of the test that was conducted on Cast Iron Detectable submitted and identified by TufTile Inc.

**TEST PROCEDURE:**

Testing was conducted in accordance with NCHRP Procedure T4-33.

A 25.4 mm (1 in.) diameter hemispherical tup made from hardened steel was attached to the steel cylinder with the total weight of 20 lbs. (see Photo No. 1). The panel under test was placed on the flat, leveled concrete floor and positioned with one of the domes centered under the impactor tup (see Photos No. 2 and 3). The impactor was allowed to vertically impact the tops of the domes of the panels with energies of 27 J and 54 J (20 and 40 ft- lbs). Three (3) impacts were conducted at each energy level at ambient temperature and three (3) impacts were conducted at each energy level at a temperature of -4° C. Each impact was conducted on a separate dome not previously impacted.

The impacted domes were evaluated in accordance with the criteria in Table 1 of NCHRP Procedure T4-33.
**TEST RESULTS:**

<table>
<thead>
<tr>
<th>Impact ID</th>
<th>Damage Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>27 J, ambient, #1</td>
<td>B* (see Photo No. 4)</td>
</tr>
<tr>
<td>27 J, ambient, #2</td>
<td>B</td>
</tr>
<tr>
<td>27 J, ambient, #3</td>
<td>B</td>
</tr>
<tr>
<td>54 J, ambient, #1</td>
<td>B (see Photo No. 5)</td>
</tr>
<tr>
<td>54 J, ambient, #2</td>
<td>B</td>
</tr>
<tr>
<td>54 J, ambient, #3</td>
<td>B</td>
</tr>
<tr>
<td>27 J, -4° C, #1</td>
<td>B (see Photo No. 6)</td>
</tr>
<tr>
<td>27 J, -4° C, #2</td>
<td>B</td>
</tr>
<tr>
<td>27 J, -4° C, #3</td>
<td>B</td>
</tr>
<tr>
<td>54 J, -4° C, #1</td>
<td>B (see Photo No. 7)</td>
</tr>
<tr>
<td>54 J, -4° C, #2</td>
<td>B</td>
</tr>
<tr>
<td>54 J, -4° C, #3</td>
<td>B</td>
</tr>
</tbody>
</table>

* - Category B: Damage to surface texture or coating only.

Please contact me if you have any questions regarding this test program.

Very truly yours

[Signature]

Yury Beyderman
Gaynes Labs, Incorporated

Photo No. 1 – Overview of the Impactor

Photo No. 2 – Overview of the Impact Tester
Photo No. 3 – Positioning of the Panel for the Impact

Photo No. 4 – Typical Damage to the Dome After 27 J Impact at Ambient Temperature
Photo No. 5 - Typical Damage to the Dome After 54 J Impact at Ambient Temperature

Photo No. 6 - Typical Damage to the Dome After 27 J Impact at -4° C Temperature
Photo No. 7 - Typical Damage to the Dome After 54 J Impact at -4°C Temperature
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WARRANTY
(Cast Iron)

TufTile, Inc. 5-Year Limited Warranty. TufTile, Inc. values your business, and the TufTile, Inc. tactile tile (the “product”) you purchased comes with a limited warranty that the product will be free from defects for a period of five years from date of installation subject to ordinary wear and tear. Failure to comply with recommended applications and installation of the product voids this warranty. Customer misuse including negligence, physical abuse and defects resulting from improper installation are not covered by this warranty. Local building codes may require minimum tactile tile performance specifications and TufTile, Inc. does not warrant product installations that violate building codes. While within the limited warranty period, if the product is not in good working order for its intended purposes, a replacement product shall be made available to the purchaser of the product. Purchaser’s remedy is limited to replacement of the product and no consequential or incidental damages and costs (including, but not limited to, lost profits, labor or transportation costs in connection with the removal, replacement and installation of the product) are recoverable or within the coverage of this limited warranty. Any representations made in connection with the sale of this product that differs from the terms of this limited warranty are not covered and should be brought to the attention of TufTile, Inc. immediately. No claim for replacement of a defective product will be honored without TufTile, Inc.’s reservation of its right to inspect the product for the claimed defect and its determination that the replacement of the product is covered by this warranty. The term of this limited warranty shall commence on the date of installation. Proof of purchase shall be required to be eligible for this warranty and to establish the commencement date of this limited warranty. No warranty replacement of the product is provided unless the purchaser’s written replacement claim is submitted to TufTile, Inc. before the expiration of five years from the date of installation of the product.

TO THE MAXIMUM EXTENT APPLICABLE AND ALLOWABLE UNDER LAW, THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE FACE OF THE TUFTILE INC. LIMITED WARRANTY, AND TUFTILE INC. DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, REGARDING THE PRODUCT, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT. TO THE MAXIMUM EXTENT ALLOWABLE BY FEDERAL AND STATE LAW, THIS WARRANTY SUPPLEMENTS OR SUPERSEDES FEDERAL AND STATE CONSUMER GOODS WARRANTY PROTECTION.
The Law and Detectable Warning Surfaces

FEDERAL

The Americans with Disabilities Act (ADA) (42 U.S.C. 12101 et seq.) is a federal civil rights law that prohibits discrimination against individuals with disabilities. The regulations issued by the Department of Justice include accessibility standards for the design, construction, and alteration of facilities. One of those requirements requires installation of detectable warning surfaces as described in these sections of the ADA Accessibility Guidelines (ADAAG) for Public Rights-Of-Way (July 26, 2011). To view the entire proposed guidelines document go to www.access-board.gov

R305.1.1 Dome Size.
The truncated domes shall have a base diameter of 23 mm (0.9 in) minimum and 36 mm (1.4 in) maximum, a top diameter of 50 percent of the base diameter minimum and 65 percent of the base diameter maximum, and a height of 5 mm (0.2 in).

R305.1.2 Dome Spacing.
The truncated domes shall have a center-to-center spacing of 41 mm (1.6 in) minimum and 61 mm (2.4 in) maximum, and a base-to-base spacing of 17 mm (0.65 in) minimum, measured between the most adjacent domes.

R305.1.3 Contrast.
Detectable warning surfaces shall contrast visually with adjacent gutter, street or highway, or pedestrian access route surface, either light-on-dark or dark-on-light.

R305.1.4 Size.
Detectable warning surfaces shall extend 610 mm (2.0 ft) minimum in the direction of pedestrian travel. At curb ramps and blended transitions, detectable warning surfaces shall extend the full width of the ramp run (excluding any flared sides), blended transition, or turning space. At pedestrian at-grade rail crossings not located within a street or highway, detectable warnings shall extend the full width of the crossing. At boarding platforms for buses and rail vehicles, detectable warning surfaces shall extend the full length of the public use areas of the platform. At boarding and alighting areas at sidewalk or street level transit stops for rail vehicles, detectable warning surfaces shall extend the full length of the transit stop.

R305.2 Placement.
The placement of detectable warning surfaces shall comply with R305.2.
R305.2.1 Perpendicular Curb Ramps.
On perpendicular curb ramps, detectable warning surfaces shall be placed as follows:

1. Where the ends of the bottom grade break are in front of the back of curb, detectable warning surfaces shall be placed at the back of curb.
2. Where the ends of the bottom grade break are behind the back of curb and the distance from either end of the bottom grade brake to the back of curb is 1.5 m (5.0 ft) or less, detectable warning surfaces shall be placed on the ramp run within one dome spacing of the bottom grade break.
3. Where the ends of the bottom grade break are behind the back of curb and the distance from either end of the bottom grade brake to the back of curb is more than 1.5 m (5.0 ft), detectable warning surfaces shall be placed on the lower landing at the back of curb.

R305.2.2 Parallel Curb Ramps.
On parallel curb ramps, detectable warning surfaces shall be placed on the turning space at the flush transition between the street and sidewalk.

R305.2.3 Blended Transitions.
On blended transitions, detectable warning surfaces shall be placed at the back of curb. Where raised pedestrian street crossings, depressed corners, or other level pedestrian street crossings are provided, detectable warning surfaces shall be placed at the flush transition between the street and the sidewalk.

R305.2.4 Pedestrian Refuge Islands.
At cut-through pedestrian refuge islands, detectable warning surfaces shall be placed at the edges of the pedestrian island and shall be separated by a 610 mm (2.0 ft) minimum length of surface without detectable warnings.

R305.2.5 Pedestrian At-Grade Rail Crossings.
At pedestrian at-grade rail crossings not located within a street or highway, detectable warning surfaces shall be placed on each side of the rail crossing. The edge of the detectable warning surface nearest the rail crossing shall be 1.8 m (6.0 ft) minimum and 4.6 m (15.0 ft) maximum from the centerline of the nearest rail. Where pedestrian gates are provided, detectable warning surfaces shall be placed on the side of the gates opposite the rail.

R305.2.6 Boarding Platforms.
At boarding platforms for buses and rail vehicles, detectable warning surfaces shall be placed at the boarding edge of the platform.

R305.2.7 Boarding and Alighting Areas.
At boarding and alighting areas at sidewalk or street level transit stops for rail vehicles, detectable warning surfaces shall be placed at the side of the boarding and alighting area facing the rail vehicles.