TopMark

SPECIFICATION

PREFORMED THERMOPLASTIC DETECTABLE WARNING MATERIAL

1.1. **USE:** A durable preformed detectable warning material suitable for use on pedestrian access routes, i.e. side walks, walking surfaces, curb ramps, ramps, blended transitions, and at crosswalks. The material must be a resilient preformed thermoplastic product with uniformly distributed abrasives both on the surface and throughout the material to provide skid resistance. The material must be resistant to the detrimental effects of motor fuels, lubricants, antifreeze, etc. The material must be capable of being affixed to portland cement concrete, including green concrete (concrete that has set but not appreciably hardened), without the use of mechanical fasteners. The material shall not require the concrete application areas to be cured or dried out. The material must be capable of being affixed to bituminous and/or portland cement concrete pavements by the use of the heat of a propane torch.

1.2. The material must be pliable during the application process to be capable of fully conforming to access route contours and geometries.

1.3. The material must be able to be cut to match access route geometries (such as a radius) using a pair of heavy duty scissors only. To facilitate faster application and to avoid potentially hazardous airborne fiber particles, diamond cutting blades and carbon-tipped saw blades shall not be required for cutting the material.

1.4. To overcome the low tensile strength of substrate surfaces without exposed aggregates (such as concrete laitance), the adhesive system must include a two-component sealer with a maximum viscosity of 300 cP, and to ensure sufficient film thickness the adhesive system must also include an overlaying two-component bonder paste with a minimum viscosity of 40,000 cP. Viscosities determined in accordance with ASTM D 4440 (25ºC; 1 Hz; 10% strain).

1.5. Two-component adhesive materials must be supplied in ready-to-use, self-mixing, dispensing systems that shall not require the applicator to perform measuring or mixing operations.

1.6. To facilitate optimized bond strength between the thermoplastic detectable warning material and the adhesive system, the entire underside of the thermoplastic detectable warning material must be uniformly roughened.

1.7. To facilitate optimized contact surface between the thermoplastic detectable warning material and the adhesive system, the thermoplastic detectable warning material must have air evacuation holes spaced no more than 2.4 in. (61 mm) apart when measured in square grid.

1.8. The material shall not require the use of mechanical fasteners, which can turn into potential tripping hazards.

1.9. The regular application process shall not include the use of flammable liquids such as acetone, where skin contact causes drying and cracking of the skin.

1.10. The regular application process shall not require mechanical preparation of the application area, such as scouring with a dust generating diamond cup grinder.

1.11. The material must be able to be applied in ambient temperatures down to 45ºF.

1.12. The material must set up rapidly, permitting the access route to be re-opened to traffic maximum 45 minutes after application.

1.13. To facilitate simpler and faster application, the regular application process shall not require separate application of perimeter sealing or caulking, or the use of masking or duct tape.

1.14. The applied material, including adhesive, shall have a combined thickness of maximum 0.17 in. (excluding the truncated domes).

1.15. To minimize airborne particle generation it shall not be necessary to scuff the underside of the material with a grinding cup or diamond blade, even when applying material in a non-linear pattern, such as a radius.

1.16. The regular application process shall not require the use of power tools, such as table saws, circular saws, grinders, hammer drills, etc.

1.17. The texture shall contrast with that of the surrounding surface.

1.18. To avoid buildup of dirt in joints, the regular application process shall not require a gap between each installed tile or section.

1.19. To facilitate ease of mobilization and avoid heavy lifting, the regular application process shall not require the use of sandbags.

1.20. The material shall have an integral color throughout the thickness of the material and the truncated domes shall be an integral part of the detectable warning material.

1.21. The material shall differ in sound and feel from adjacent platform surface in "sound-on-cane" and resiliency.

2. **MANUFACTURING CONTROL AND ISO CERTIFICATION**: The manufacturer must be ISO 9001:2008 certified and provide proof of current certification.

3. **MATERIAL:** Must be composed of ester modified rosins in conjunction with aggregates, pigments, and binders which have been factory produced as a finished product. The material must be impervious to degradation by motor fuels, lubricants, antifreeze, etc. The truncated domes must be an integral part of the preformed thermoplastic material. The material shall consist of one preformed thermoplastic part and adhesive only. Mechanical fasteners shall not be part of the material.

3.1. Colors and Pigments:

3.1.1. The detectable warning material shall be available in the following colors: White, Black, Yellow, Brick-red, and Blue. The pigments must be organic and/or not contain heavy metals. The color pigment must be distributed throughout the thickness of the preformed thermoplastic material.

3.2. Dimensions and Geometry: The detectable warning material shall be available in the following product sizes and meet the dimensions shown in Figures 1 and 2.

English	Metric
12 in. x 24 in.	30.5 cm x 61.0 cm
12 in. x 36 in.	30.5 cm x 91.4 cm
24 in. x 24 in.	61.0 cm x 61.0 cm
24 in. x 36 in.	61.0 cm x 91.4 cm
24 in. x 48 in.	61.0 cm x 121.9 cm
24 in. x 60 in.	61.0 cm x 152.4 cm

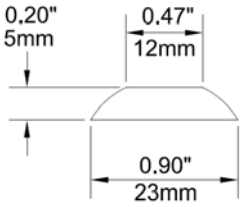

Figure 1. Dome Section

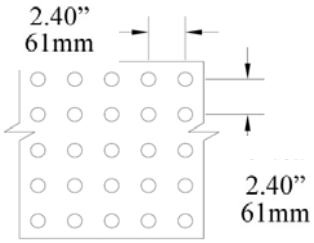

Figure 2. Dome Spacing

3.3. Configuration: The detectable warning material shall be supplied as a kit that contains the domed preformed thermoplastic material and an adhesive system. The application process shall not require any other consumable materials (such as acetone, rags, or masking tape), or other consumable tools (such as saw blades, drill bits, or markers) not contained in the kit.

3.4. Hardness: The hardness of the domed preformed thermoplastic material shall be above 90 Shore A at 25ºC when tested according to ASTM D 2240.

3.5. Slip Resistance: The static coefficient of friction shall be 0.8 or greater when measured on the top of the truncated domes and 0.8 or greater when measured between the domes as tested per ASTM C 1028 (dry and wet).

3.6. Environmental Resistance: The material must be resistant to deterioration due to exposure to sunlight, water, salt or adverse weather conditions and impervious to oil and gasoline.

3.7. The material and adhesive system shall be solvent free and contain no volatile organic compounds (VOCs).

4. **APPLICATION**:

Asphalt and Portland Cement Concrete: The material must be able to be applied to both bituminous and non-bituminous surfaces. The material must be able to be applied at ambient and substrate temperatures at 45ºF and rising. The products must be applied according to the manufacturer's instructions. The pavement shall be clean and free of debris. Supplier must enclose application instructions in English and Spanish with each box/package. No power tools shall be necessary for the application. Mechanical fasteners shall not be required for the application.

5. **PACKAGING:** The preformed thermoplastic material shall be placed in a box with cardboard stiffeners and impact absorbers where necessary to prevent damage in transit. The cartons in which packed shall be non-returnable, and be labeled for ease of identification.

6. **TECHNICAL SERVICES:** The successful bidder shall provide training and technical services as required.