A method for filling a construction joint space includes applying a primer layer to one or more construction member edges of one or more construction members, and chemically reacting a filler layer with the primer layer to at least partially fill a remainder of the construction joint space with the filler layer. The construction member edge(s) at least partially form the construction joint space. The primer layer can include an epoxy primer. The filler layer can include at least one of a polyurea and a polyurethane. The epoxy primer can be coated with the filler layer. The method can also include the step of applying a filler retainer to a top surface of the construction member to substantially confine the filler layer within the joint space. A system for filling construction joint spaces includes one or more of a primer layer, a filler layer and a filler retainer.
PREPARE JOINT SPACE

APPLY PRIMER LAYER TO TILE EDGES WITHIN THE JOINT SPACE

FOR NON-HORIZONTAL SURFACE, POSITION FILLER RETAINER OVER JOINT SPACE

APPLY FILLER LAYER INTO THE JOINT SPACE

ALLOW FILLER LAYER TO CURE, THEN REMOVE FILLER RETAINER (FOR NON-HORIZONTAL SURFACE)

Fig. 5
SYSTEM AND METHOD FOR FILLING CONSTRUCTION JOINT SPACES

RELATED APPLICATION

[0001] This application claims priority on U.S. Provisional Application Ser. No. 62/209,036, filed Aug. 24, 2015, and entitled “SYSTEM FOR FILLING CONSTRUCTION JOINT SPACES AND METHOD OF INSTALLATION”. As far as permitted, the contents of U.S. Provisional Application Ser. No. 62/209,036 are incorporated herein by reference.

BACKGROUND

[0002] It is well established in material science that most construction materials such as steel, concrete, rock, masonry, and mortars are subjected to volumetric changes when exposed to natural phenomena such as temperature gradients allowing moisture absorption or evaporation, among others. Anticipating such phenomena, civil engineers consider the use of contraction joint spaces to allow for volumetric changes to take place in horizontal and vertical surface of buildings, bridges, patios, walkways, etc.

[0003] Typical horizontal surfaces, such as reinforced concrete floors, usually consider two types of construction joints: contraction joints and expansion joints. Contraction joints are cut on the concrete surface with a certain separation using a grid pattern. The joint depth is typically a small percentage of the floor depth and the joint width is normally a small percentage of the joint depth. In fact, the joint depth does not reach the reinforcement depth allowing the reinforcement to run continuous under the joint. The objective of the contraction joint is to relocate to the bottom of the joint any concrete surface cracks occurring due to volumetric changes caused by moisture evaporation. As a result, if the joint grid pattern is properly designed, what would have been a random cracking pattern on the surface of the floor becomes a predictable grid pattern where the cracks are hidden from view at the bottom of the joint.

[0004] Expansion joints are not cut; they are a natural boundary of the floor area and their locations are pre-established prior to pouring the concrete. The concrete reinforcement is interrupted at the expansion joint, which allows for structural independence of the floors at both sides of the expansion joint or between the floor and any other building component. The expansion joint depth covers the full depth of the floor and the joint width is a small percentage of the joint depth. The main objective of the expansion joint is to allow volumetric changes in the concrete caused by thermal gradients; however, in some cases the expansion joint may be used as a seismic joint by taking advantage of the structural independence of the building components generating the joint. In this case, the seismic response of such components will also be independent allowing for a more efficient seismic performance of the global structural system of the building.

[0005] Typical vertical surfaces such as reinforced concrete walls may also require a combination of contraction and expansion joints for the same reasons. Sometimes the walls are made of individual prefabricated reinforced concrete panels that are assembled on site. Obviously, in this case all joints will be expansion joints, some of which may also serve as seismic joints.

[0006] Architectural finishes such as floor tiles and wall tiles are typically applied over horizontal, vertical or other angled building surfaces. As used herein, the term “tile” refers to any construction member that has at least one edge that at least partially forms a space between the edge and another structure. To illustrate one representative example, two adjacent ceramic tiles typically are spaced apart thereby forming a joint space so that some compound such as grout can be positioned in that joint space between the tiles. Such tiles have a variety of thicknesses and can be made of ceramic, mortars, granite, stone, porcelain, glass, marble, concrete, etc. Since each tile is an individual element that may be subjected to volumetric changes due to mainly temperature gradients, they can be placed right next to each other with joint spaces around their perimeter to allow for such changes to take place. For typical thin tiles with small surface dimensions, such space is usually filled with a relatively rigid mortar type material since the expected volumetric changes are not significant and can be absorbed by the mortar joint filler with little or no visible damage. However, as the tile thickness and/or surface dimensions increases, the volumetric changes increase accordingly.

[0007] Most joints will require some type of a joint filler in order to seal the building against moisture and/or dust intrusion coming from the outside or protect the environment from polluting liquids or gases generated inside the building. Joint fillers can also mitigate the damage due to impact and weathering of the joint edges. Thus, the physical characteristics and durability of the joint filler must be properly considered against the expected exposure conditions in order to avoid unnecessary functional, environmental and/or aesthetic problems. For example, chemical resistant joint fillers may be required to seal a containment area by not allowing polluting gases or liquids to seep through floor and/or wall joints. Also, color stability of the joint filler under direct sunlight may be an aesthetic concern for granite or marble floors or wall tile arrangements that generate certain color patterns.

[0008] If the bond strength at the tile-joint filler interface is adequate, but the joint filler lacks the required flexibility, total or partial joint movement restriction is generated. As a result, the thermal expansion effect of the tiles can induce such problems as tile cracking and/or separation of the tiles from a subsurface substrate system due to adhesive mortar failure.

[0009] If the bond strength at the tile-joint filler interface is weak, joint filler separation from the joint walls may occur. This separation can cause moisture and/or dust intrusion that may further weaken the bond. Also, filler extraction may occur due to suction forces at the joints generated by cleaning and maintenance equipment. The loss of joint filler may generate an aesthetic problem at the joint areas if the exposed joint edges are subjected to deterioration due to weathering and/or impact damage. Moreover, the loss of joint filler may cause moisture or dust intrusion to the interior space of the building and/or expose the environment to pollution from gases or liquids escaping from the interior space of the building.

[0010] The filler system and method provided herein addresses a long standing need in the construction industry by providing a joint filler technology for construction joint spaces, such as floor joint spaces, wall joint spaces and/or other surface joint spaces (collectively referred to herein as a “joint space” or “joint spaces”), which can provide both (1)
the required flexibility, and (2) the joint wall bond strength to address joint movements due to volumetric changes.

0011 Conventional joint fillers can provide for some joint movement to at least partially dissipate thermal expansion of tiles. However, they typically lack the proper bond strength to avoid separation from the joint walls and/or extraction from the joint space. Certain joint fillers can improve on the low bond strength characteristics. Unfortunately, these joint fillers typically lack the requisite flexibility. As a result, total or partial joint movement restriction is introduced which can cause the tiles to crack and/or separate due to tile mortar bond failure.

SUMMARY

0012 The present invention is directed toward a method for filling a construction joint space. In one embodiment, the method includes the steps of applying a primer layer to a construction member edge of a construction member, and chemically reacting a filler layer with the primer layer to at least partially fill a remainder of the construction joint space with the filler layer. The construction member edge at least partially forms the construction joint space. In some embodiments, the primer layer can include an epoxy primer. In various embodiments, the filler layer can include at least one of a polyurea and a polyurethane.

0013 In certain embodiments, the step of chemically reacting can include covering the epoxy primer with the filler layer.

0014 In some embodiments, the step of at least partially filling can include filling the remainder of the construction joint space with the filler layer.

0015 In various applications, the step of applying can include using a two-part epoxy primer.

0016 In certain embodiments, the joint filler does not include polyurea material. In alternative embodiments, the filler layer does not include polyurethane material.

0017 In another embodiment, the method also includes the step of applying a filler retainer to a top surface of the construction member to substantially confine the filler layer within the joint space.

0018 The present invention is also directed toward a method for filling a construction joint space, the method comprising the steps of applying a primer layer to a construction member edge of a construction member and at least partially filling a remainder of the construction joint space with the filler layer so that the filler layer contacts the primer layer. In certain embodiments, the construction member edge at least partially forms the construction joint space. In various embodiments, the primer layer can include an epoxy primer. Further, the filler layer can include a polyurea or a polyurethane material.

0019 The present invention is also directed toward a system used for filling construction joint spaces that is installed utilizing any of the methods provided herein.

BRIEF DESCRIPTION OF THE DRAWINGS

0020 The novel features of this invention, as well as the invention itself, both as to its structure and its operation, will be best understood from the accompanying drawings, taken in conjunction with the accompanying description, in which similar reference characters refer to similar parts, and in which:

0021 FIG. 1A is a perspective view of a surface and two tiles that form a joint space between the two tiles, and one embodiment of a joint space filling system having features of the present invention including a primer layer and a filler layer;

0022 FIG. 1B is a cross-sectional view taken on line 12-12 in FIG. 1A;

0023 FIG. 2A is a perspective view of the surface and the two tiles illustrated in FIG. 1A, with the joint space filling system omitted for clarity;

0024 FIG. 2B is a cross-sectional view taken on line 2B-2B in FIG. 2A;

0025 FIG. 3A is a perspective view of the surface and the two tiles and the joint space filling system illustrated in FIG. 1A, with the filler layer omitted for clarity;

0026 FIG. 3B is a cross-sectional view taken on line 3B-3B in FIG. 3A;

0027 FIG. 4A is a perspective view of two tiles positioned on a non-horizontal surface, and a portion of one embodiment of the joint space filling system including the primer layer and a filler retainer, with a portion of the filler retainer illustrated in phantom;

0028 FIG. 4B is a perspective view of two tiles positioned on a non-horizontal surface, and at least a portion of one embodiment of the joint filling system including the primer layer, the filler layer and the filler retainer, with a portion of the filler retainer illustrated in phantom;

0029 FIG. 4C is a cross-sectional view taken on line 4C-4C in FIG. 4B; and

0030 FIG. 5 is a flowchart illustrating one embodiment of a method for filling a construction joint space.

DESCRIPTION

0031 Embodiments of the present invention are described herein in the context of a joint space filling system (hereinafter sometimes referred to simply as a "system") and a method for filling construction joint spaces. Those of ordinary skill in the art will realize that the following detailed description of the present invention is illustrative only and is not intended to be in any way limiting. Other embodiments of the present invention will readily suggest themselves to such skilled persons having the benefit of this disclosure. Reference will now be made in detail to implementations of the present invention as illustrated in the accompanying drawings. The same or similar reference indicators will be used throughout the drawings and the following detailed description to refer to the same or like parts.

0032 In the interest of clarity, not all of the routine features of the implementations described herein are shown and described. It will, of course, be appreciated that in the development of any such actual implementation, numerous implementation-specific decisions must be made in order to achieve the developer's specific goals, such as compliance with application- and business-related constraints, and that these specific goals will vary from one implementation to another and from one developer to another. Moreover, it will be appreciated that such a development effort might be complex and time-consuming, but would nevertheless be a routine undertaking of engineering for those of ordinary skill in the art having the benefit of this disclosure. Further, although the disclosure herein refers specifically to floor tiles, ceiling tiles and/or wall tiles (hereinafter referred to simply as a "tile" or "tiles") as a matter of convenience, it
is understood that the system may also be utilized in and/or with any joint space that is formed at least partially by one or more construction materials.

[0033] FIG. 1A is a perspective view of at least a portion of a joint space filling system 10, and two construction members 12 (also sometimes referred to herein as “tiles”) secured to or otherwise positioned on a surface 14. The tiles 12 form the “walls” of a joint space 16, with the surface 14 forming a bottom (or floor) of the joint space 16. It is recognized that the joint space 16 can be formed by one tile 12 and another object (not shown), or alternatively, by greater than two tiles 12. Each tile 12 that at least partially forms a joint space 16 includes one or more construction member edges 217 (illustrated in FIGS. 2A and 2B, and also sometimes referred to herein as joint tile edges), each of which at least partially forms a wall of the joint space 16.

[0034] In alternate embodiments, the joint space filling system 10 can partially, substantially or completely fill the joint space 16, and can exhibit an improved combination of significant resilience, deformation capability and bond strength. The design of the system 10 can vary. In the embodiment illustrated in FIG. 1A, the system 10 includes a primer layer 18 and a filler layer 20.

[0035] In certain embodiments, the primer layer 18 can include an epoxy primer. In one embodiment, the primer layer 18 can include a two-component epoxy primer that is applied within the joint space 16 prior to the application of the filler layer 20. In certain embodiments, a low viscosity 100% solid epoxy primer can be used for the primer layer 18. Alternatively, other suitable types of epoxy primers can be utilized for the primer layer 18. As provided herein, the primer layer 18 can be applied to a portion of the tiles that are positioned within the joint space 16. In certain embodiments, the primer layer 18 can be applied at a rate of between approximately 0.7 m² to 17.5 m² per liter so that a film with minimum thickness between approximately 0.05-1.25 mm is generated over both joint walls. In one embodiment, the primer layer 18 can be applied at a rate of approximately 3.5 m² per liter so that a film with minimum thickness of approximately 0.25 mm is generated over both joint walls. Alternatively, other thicknesses of the primer layer can be used.

[0036] In certain embodiments, the filler layer 20 can include an elastomer. For example, the filler layer 20 can include a two-component flexible subsystem that chemically reacts with, and develops a strong chemical bond with the primer layer 212. The filler layer 20 is applied as a joint filler and can include any adequate flexible material formulation, such as, but not limited to, polyureas elastomers, polyurea hybrids, polyurethane elastomers and/or hybrids, silicone, etc., where the specific formulation to be used can be chosen based on the joint exposure conditions.

[0037] FIG. 1B is a cross-sectional view of the tiles 12 and the joint space filling system 10, including the primer layer 18 and the filler layer 20 taken on line 1B-1B in FIG. 1A.

[0038] FIG. 2A is a perspective view of the surface 14 and the two tiles 12 illustrated in FIG. 1A. FIG. 2A shows the joint space 16 prior to the addition of the primer layer 18 (illustrated in FIG. 1A) to the one or more joint tile edges 217, and the filler layer 20 (illustrated in FIG. 1A). FIG. 2B is a cross-sectional view of the two tiles 12 taken on line 2B-2B in FIG. 2A. As illustrated in FIG. 2B, the joint space 16 is clearly shown directly between the two tiles 12, prior to the addition of the primer layer 18 (illustrated in FIG. 1A) to the one or more joint tile edges 217, and the filler layer 20 (illustrated in FIG. 1A).

[0040] FIG. 3A is a perspective view of the surface 14 and the two tiles 12 and the joint space filling system 10 illustrated in FIG. 1A, with the filler layer 20 (illustrated in FIG. 1A) omitted for clarity. FIG. 3A represents a first step in application of the system 10, by applying the primer layer 18 to one or more of the joint tile edges 217.

[0041] FIG. 3B is a cross-sectional view taken on line 3B-3B in FIG. 3A, illustrating the primer layer 18 positioned on the two joint tile edges 217 of the tiles 12, and within the joint space 16.

[0042] FIG. 4A is a perspective view of two tiles 412 positioned on a non-horizontal surface 414, and a portion of one embodiment of the joint space filling system 410 including the primer layer 418 and a filler retainer 422. In this embodiment, the tiles 412 are positioned in a non-horizontal manner, such as on a vertical or angled surface 414. In the embodiment illustrated in FIG. 4A, in order to inhibit the filler layer 420 (illustrated in FIG. 4B) from migrating out of the joint space 416 during addition of the filler layer 420 within the joint space 416, the filler retainer 422 is temporarily positioned over the joint space 416, and substantially flush with a top surface 424 of the tiles 412. In one embodiment, the filler retainer 422 can include an acrylic (or other suitable material) transparent strip so that filling of the joint space 416 can be observed through the filler retainer 422. Further, in this embodiment, the filler retainer 422 can include a bottom retainer portion 426, which supports the filler layer 420 until the filler layer 420 can cure and remain in the joint space 416 on its own. Stated another way, the filler retainer 422 substantially confines the filler layer 420 within the joint space 416 until the filler layer 420 has sufficiently cured. The filler retainer 422 can then be removed once the filler layer 420 has cured.

[0043] In the embodiment illustrated in FIG. 4A, the filler retainer 422 does not cover a joint space opening 427, which is used as an opening for the addition of the filler layer 420 into the joint space 416. In this embodiment, the filler layer 420 is added into the joint space 416 via the joint space opening 427, and gravity forces the filler layer 420 to substantially or completely fill the joint space 416. In this embodiment, the filler layer 420 can also be forced into the joint space (via the joint space opening 427) by forced injection, or by any other suitable manner.

[0044] In one embodiment, the filler retainer 422 can be formed from a material such as plastic or another suitable material. Further, the filler retainer 422 can include an adhesive (not shown), such as a tacky surface, that allows the filler retainer 422 to be temporarily secured to the top surface 424 and/or a bottom edge 428 of the tiles 412. In this embodiment, the filler retainer 422 can have a retainer width 430 that is at least as wide as a joint space width 432 of the joint space 416 so that the filler layer 420 is inhibited from exiting the joint space 416.

[0045] FIG. 4B is a perspective view of two tiles 412 positioned on a non-horizontal surface 414, and at least a portion of one embodiment of the joint space filling system 410 including the primer layer 418, the filler layer 420 and the filler retainer 422. As illustrated in FIG. 4B, the filler retainer 422 retains the filler layer 420 within the joint space 416. Once the filler layer 420 has sufficiently cured, the filler
retainer 422 can be removed, and the primer layer 418 and the filler layer 420 will remain in place within the joint space 416.

[0046] FIG. 4C is a cross-sectional view taken on line 4-C in FIG. 4B, illustrating the joint space filling system 410 and two tiles 412. In this embodiment, the filler retainer 422 has a retainer width 430 that is greater than a joint space width 432 of the joint space 416 formed by the two tiles 412. With this design, the filler layer 420 can substantially or completely fill the joint space 416. Further, the likelihood of any of the filler layer 420 exiting the joint space 416 is decreased or eliminated.

[0047] FIG. 5 is a flowchart illustrating one embodiment of a method for filling a construction joint space. It is understood that the method can omit one or more steps described in FIG. 5. Alternatively, the method can add steps not included in the embodiment described in FIG. 5.

[0048] At step 500, the joint space is prepared. Preparation can include one or more of the following:

[0049] A. Remove using proper manual or mechanical means any existing dust, film or residues on the tile edge(s) that may hinder the bond between the primer layer and such joint tile edges. For example, power tools such as grinders with metal wire brush wheel that can access the full depth of the joint space can be used for this purpose. Exposure of a new tile edge surface can facilitate proper seepage of the primer layer onto and/or into the tile edge(s).

[0050] B. Apply adhesive tape (not shown) to the top surfaces of the tiles, adjacent to the joint space. The adhesive tape can protect the exposed top surfaces of the tiles surrounding the joint space from direct contact with the primer layer and/or filler layer. If incidental drops of the primer layer and/or filler layer fall outside the taped area on the tile surface, these drops can be removed with a cloth impregnated with acetone or another suitable solvent, or by other suitable methods.

[0051] At step 502, the primer layer is applied to the joint tile edges within the joint space. Care should be taken so that the pot life of the primer layer is not exceeded. As a representative example, if the pot life of the primer layer is about 2 hours, to avoid unnecessary waste of the primer layer materials, more of the primer layer should not be mixed than can be applied on the joint tile edges in approximately a 1.5 hour period. In one embodiment, the primer layer can be applied onto the joint tile edges using relatively thin paint brush. The brushes should be able to reach the full depth of the joint space so that the primer layer can be applied all the way to the bottom of the joint space. In certain embodiments, the primer layer can be applied at a rate of between approximately 0.7 m² to 17.5 m² per liter so that a film with minimum thickness of between approximately 0.05-1.25 mm is generated over both joint walls. In one embodiment, the epoxy primer can be applied at a rate of approximately 3.5 m² per liter so that a film with minimum thickness of approximately 0.25 mm is generated over both joint walls. The primer layer should be allowed to set for a suitable period of time. In one embodiment, the applied epoxy primer should still feel tacky when touched.

[0052] At step 504, for non-horizontal surfaces, the filler retainer can be positioned over the joint space. The filler retainer should leave a top opening of the joint space so that the filler layer can be added to the joint space. For horizontal surfaces, step 504 can be omitted.

[0053] At step 506, the filler layer is added to the joint space to partially or completely fill the joint space. The filler layer contacts at least a portion of the primer layer to permit a chemical reaction/bonding of the filler layer to the primer layer. If the joint space filling system is being used on exterior surfaces and construction members that are exposed to direct sunlight, step 506 can include the addition of a top coat of ultraviolet resistant filler layer may be used to maximize filler color stability. In this embodiment, the standard filler layer can be leveled out with approximately 1 cm (depending on the size of the joint space) remaining to the top of the joint space. Within a relatively short period of time (e.g., about 10 minutes), the remaining approximately 1 cm depth can be filled with ultraviolet resistant filler layer material. In an alternative embodiment, the ultraviolet resistant filler can be used to completely fill the joint space, omitting the use of the standard filler layer.

[0054] At step 508, the filler layer is allowed to cure. For non-horizontal surfaces, once the filler layer has sufficiently cured, the filler retainer can be removed, and the filler layer is then allowed to completely cure. Once the joint space is completely filled, in one embodiment, at least approximately 2 hours of undisturbed cure of the filler layer can occur prior to removing the adhesive tape and/or the filler retainer.

[0055] The system 10 described herein addresses one or more of the following problems, and includes one or more of the following advantages over conventional joint space fillers. The system 10 allows for considerable thermal movement of floor joints and/or wall joints without exhibiting cracking, tearing or bond failure from the joint walls. The system 10 has acceptable color stability when subjected to ultraviolet radiation (direct sunlight) and also self-heals by practically recuperating the original surface conditions when struck by sharp objects. The system 10 and method provided herein can include hybrid elastomer-epoxy formulation of the system 10, which integrates one or more of the following features and/or advantages in a single system 10:

[0056] Strong bond between the filler layer and the joint tile edges (via the primer layer) in order to avoid pull out and/or damage by existing floor maintenance and/or cleaning equipment.

[0057] Enough flexibility to accommodate volumetric changes in the construction members caused by environmental temperature gradients.

[0058] Self-heals by dissipating imprints caused by sharp object impacts.


[0060] Ease of application that allows use of automated installation equipment for large projects.

[0061] It is understood that although a number of different embodiments of the joint space filling system 10 and method for filling construction joint spaces have been described herein, one or more features of any one embodiment can be combined with one or more features of one or more of the other embodiment, provided that such combination satisfies the intent of the present invention.

[0062] While a number of exemplary aspects and embodiments of the joint space filling system 10 and method for filling construction joint spaces have been shown and disclosed herein above, those of skill in the art will recognize certain modifications, permutations, additions and sub-combinations thereof. It is therefore intended that the system and method shall be interpreted to include all such modifica-
tions, permutations, additions and sub-combinations as are within their true spirit and scope, and no limitations are intended to the details of construction or design herein shown.

What is claimed is:

1. A method for filling a construction joint space, the method comprising the steps of:
   applying a primer layer to a construction member edge of a construction member, the construction member edge at least partially forming the construction joint space, the primer layer including an epoxy primer; and
   chemically reacting a filler layer with the primer layer to at least partially fill a remainder of the construction joint space with the filler layer, the filler layer including at least one of a polyurea and a polyurethane.

2. The method of claim 1 wherein the step of chemically reacting includes covering the epoxy primer with the filler layer.

3. The method of claim 1 wherein the step of at least partially filling includes filling the remainder of the construction joint space with the filler layer.

4. The method of claim 1 wherein the step of applying includes using a two-part epoxy primer.

5. The method of claim 1 wherein the joint filler does not include the polyurea material.

6. The method of claim 1 wherein the filler layer does not include the polyurethane material.

7. The method of claim 1 further comprising the step of applying a filler retainer to a top surface of the construction member to substantially confine the filler layer within the joint space.

8. A system used for filling construction joint spaces that is installed utilizing the method of claim 1.

9. A method for filling a construction joint space, the method comprising the steps of:
   applying a primer layer to a construction member edge of a construction member, the construction member edge at least partially forming the construction joint space, the primer layer including an epoxy primer; and
   at least partially filling a remainder of the construction joint space with the filler layer so that the filler layer contacts the primer layer, the filler layer including a polyurea.

10. The method of claim 9 wherein the step of at least partially filling includes chemically bonding the filler layer with the primer layer.

11. The method of claim 9 wherein the step of applying includes using a two-part epoxy primer.

12. The method of claim 9 wherein the step of at least partially filling includes covering the epoxy primer with the filler layer.

13. The method of claim 9 wherein the step of at least partially filling includes filling the remainder of the construction joint space with the filler layer.

14. A system used for filling construction joint spaces that is installed utilizing the method of claim 9.

15. A method for filling a construction joint space, the method comprising the steps of:
   applying a primer layer to a construction member edge of a construction member, the construction member edge at least partially forming the construction joint space, the primer layer including an epoxy primer; and
   at least partially filling a remainder of the construction joint space with the filler layer so that the filler layer contacts the primer layer, the filler layer including a polyurethane.

16. The method of claim 15 wherein the step of at least partially filling includes chemically bonding the filler layer with the primer layer.

17. The method of claim 15 wherein the step of applying includes using a two-part epoxy primer.

18. The method of claim 15 wherein the step of at least partially filling includes covering the epoxy primer with the filler layer.

19. The method of claim 15 wherein the step of at least partially filling includes filling the remainder of the construction joint space with the filler layer.

20. A system used for filling construction joint spaces that is installed utilizing the method of claim 15.

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