ABSTRACT: An expansion joint assembly used between concrete slabs. A lower expansion joint strip that becomes permanently positioned between the concrete slabs and a removable topping strip that exposes a controlled depth groove above the expansion joint strip for receiving a sealant. In a modification, the upper edge of the expansion joint strip is coated with a material that will not bond or adhere to the sealant, permitting unrestricted lateral expansion and contraction of the sealant.
EXPANSION JOINT FILLER

BRIEF DESCRIPTION OF THE INVENTION

This expansion joint assembly comprises a lower expansion joint strip and an upper topping strip fastened together by staples or other mechanical means. The upper strip is removable after the expansion joint assembly has been positioned between concrete slabs and after the concrete has set. The exposed groove is then filled with sealant to provide a liquidtight seal between the concrete slabs.

The expansion joint strip and topping strip are made of compressed wood fiber sawed to form the two pieces. The result, after removal of the topping strip, is a clean groove with square caulking corners. The sealant will readily adhere to the concrete slabs because the wood fiber expansion joint strip material leaves no contaminating film. It is notable that the assembly meets the requirements of ASTM D-1751 Type III and Federal Specification HH-F-344e. No film is left on the surface of the concrete as would be the case if other materials, such as polystyrene or asphalt-impregnated fiber board, were used. Furthermore, routing of the expansion joint strip to make a groove for receiving sealant is eliminated and instead, the topping strip can be quickly and easily removed leaving a groove of uniform depth controlled by the height of the topping strip.

In a modification of the invention, the upper edge of the expansion joint strip is coated with a material that will not bond to the sealant. This coating may be in the form of a tape, such as an ethylene tape, glued to the upper edge of the expansion joint strip, or may be a liquid material applied to the upper edge of the expansion joint strip that, when dry, will not bond to the sealant. The advantage of this modification is that the sealant will bond only to the adjacent side edges of the concrete slabs, and the absence of a bond to the coating material leaves the sealant free to expand and contract laterally with expansion and contraction of the concrete in varying weather conditions.

In all of the foregoing respects, and for additional reasons that will be apparent from the following description, this invention differs from and has advantages over Mauve, U.S. Pat. No. 2,967,467. In the Mauve patent, the Styrofoam can be routed out to some degree, but it is thereafter deformed by the use of a hot asphalt mastic which will melt the Styrofoam. Also, the Styrofoam tends to leave a film on the concrete surfaces to impede the adherence of sealant to the concrete and destroy the watertight properties required of the joint.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary perspective view of the expansion joint assembly.

FIG. 2 is a view in lateral section through the expansion joint assembly as positioned between two concrete slabs prior to removal of the topping strip.

FIG. 3 is a view in section similar to that of FIG. 2 illustrating the removal of the topping strip.

FIG. 4 is a view in section similar to that of FIGS. 2 and 3 after the application of sealant.

FIG. 5 is a fragmentary perspective view of a modified expansion joint assembly incorporating a bond breaker strip.

FIG. 6 is a transverse sectional view of the expansion joint assembly of FIG. 5 showing the topping strip removed and sealant applied in place.

DETAILED DESCRIPTION OF THE INVENTION

The expansion joint assembly 10 of FIG. 1-4 comprises an expansion joint strip 11 and a topping strip 12 held together by staples 13. The expansion joint strip 11 and the topping strip 12 are made of compressed wood fiber, such as is made in expansion joint fillers by Homacote Company of Trenton, N.J. and sold under the name Homex 300. The staples 13 are conventional metal staples long enough to fasten the topping strip 12 to the expansion joint strip 11.

FIGS. 2, 3 and 4 illustrate the process of applying and using the expansion joint assembly 10. After a base 14 as been suitably prepared in the conventional manner, elongated units having the components of the expansion joint assembly 10 as illustrated in FIG. 1 are positioned where expansion joints are to be located between concrete slabs. Then concrete is poured to form concrete slabs 15 and 16. It will be noted that up to this point in the application, the expansion joint assembly 10 has been supplied and handled as an integral unit consisting of the expansion joint strip 11, the topping strip 12, held together by the staples 13.

After the concrete has set, the topping strip 12 is removed as indicated in FIG. 3. Removal of this topping strip 12 is easy and is done either by first prying the staples loose or by lifting one end of the topping strip 12 slightly and gradually pulling it free of the expansion joint strip 11.

In the final step, the groove 17 that is exposed upon removal of the topping strip 12 is filled with a suitable sealant. Any commercial sealant, such as a polysulfide, urethane or silicone may be used. In this embodiment, the sealant 18 bonds to the portions of the adjacent sides of the concrete slabs 15 and 16 which define the sides of the groove 17 and bonds to the upper edge of the expansion joint strip 11 which defines the base of the groove 17. When the sealant has dried, it forms a liquid-tight seal to prevent moisture from seeping into the area between the concrete slabs 15 and 16.

It is important in this invention that the expansion joint assembly 10 has no tar or asphalt additives and does not have the disadvantages of a Styrofoam material which would deposit a thin film on the adjacent surfaces of the concrete slabs 15 and 16 and prevent adherence to those exposed concrete surfaces of cold-applied sealants. In addition, the expansion joint strip 11 will not be melted or deformed if a hot asphalt mastic is used as the sealant 18.

The sealant 18 extends a uniform depth throughout the length of the expansion joint because of the uniform height of the topping strip 12 which was removed in contrast with the usual routing of the expansion joint filler that conventionally must be done before a sealant is applied.

FIGS. 5 and 6 illustrate a modification of the invention. This expansion joint assembly 20 has an expansion joint strip 21 and an upper topping strip 22. A thin bond breaker 23 is located between the expansion joint strip 21 and the topping strip 22. The bond-breaking strip 23 may comprise a tape of any material to which the sealant to be used will not bond or adhere, such as an ethylene strip. The bond-breaking strip 23 is fastened to the upper edge of the expansion joint strip 21 by a suitable glue or adhesive. The topping strip 22 is removably secured to the expansion joint strip 21 by staples 25 that extend through the bond-breaking strip 23 and into the expansion joint strip 21. Alternative to the tape 23, a bond-breaking surface may be applied to the upper edge 24 of the expansion joint strip by coating the upper edge 24 with a suitable substance of plastic or other material that, when set, will not adhere to the sealant that is to replace the topping strip 22. In this alternative form, the topping strip 22 is stapled to the expansion joint strip 21 after such a liquid coating has set and dried.

FIG. 6 shows the process of using the expansion joint assembly 20 of FIG. 5. After preparation of the base 14, elongated expansion joint assemblies 20 are located along the areas between proposed concrete slabs, such as the slabs 15 and 16. Thereafter, the concrete is poured and sets to form the slabs 15 and 16. Once the concrete has set, the topping strip 22 may be removed to expose a groove 26 of uniform depth defined by the adjacent sides of the concrete slabs 15 and 16 and at its bottom by the ethylene strip 23. The groove 26 is then filled with sealant 27 which bonds to those adjacent sides of the concrete slabs 15 and 16 which define the sidewalls of the groove 26 but does not bond to the ethylene strip 23. The result is a liquid-tight seal bonded to the concrete slabs 15 and 16 that will expand and contract with expansion and contraction of the groove 26 unimpeded by adherence to the base of
the groove 26 defined by the ethylene strip 23. In this respect, the expansion joint assembly 20, while slightly more costly than the expansion joint assembly 10, has the advantage that the sealant 27 has unimpeded lateral expansion and contraction.

The expansion joint assemblies 10 and 20 are such that they may be supplied in the assembled packages illustrated in FIGS. 1 and 5. Manufacture of the expansion joint assembly 10 is quick and easy. A conventional compressed wood expansion joint filler, such as the aforementioned Homex 300 expansion joint filler, is selected for the desired expansion joint size, the width of the expansion joint filler depending upon the thickness the expansion joint is to have. Then the compressed wood expansion joint filler is cut lengthwise, preferably with a carbide tip saw for a clean-sawn surface, to form the expansion joint strip 11 and the topping strip 12. The topping strip 12 is then fastened to the expansion joint strip 11 with the staples 13 to complete the expansion joint assembly 10.

In making the expansion joint assembly 20, the foregoing process is repeated except that, prior to fastening the topping strip 22 to the expansion joint strip 21 by the staples 25, the ethylene tape 23 is applied to the upper edge 24 of the expansion joint strip 21. In both expansion joint assemblies 10 and 20, the assembled unit is ready for installation to be followed by simple removal of the staples 13 and the topping strip 12 or the staples 25 and the topping strip 22.

Various changes and modifications may be made within this invention as will be readily apparent to those skilled in the art. Such changes and modifications are within the scope and teaching of this invention as defined by the claims appended hereto.

What is claimed is:

1. An expansion joint assembly for use between concrete elements comprising an elongated expansion joint strip permanently positioned between the concrete elements, a thin layer of material bonded to the top edge of the expansion joint strip and being substantially nonadherable to a sealant, an elongated topping strip removably attached on the upper surface of the thin bonded layer, the assembly being positioned between the concrete elements with at least most of the topping strip positioned below the upper surface of the concrete elements, whereby removal of the topping strip exposes a controlled depth groove above the thin bonded layer for receiving a sealant which, as it expands and contracts, is unimpeded by contact with the thin bonded layer.

2. The expansion joint assembly of claim 1 wherein the expansion joint strip and topping strip are of compressed wood.

3. The expansion joint assembly of claim 1 wherein the fastening means comprises removable rigid elements extending through the topping strip and into the expansion joint strip.

4. The expansion joint assembly of claim 3 wherein the rigid elements are staples.

5. The expansion joint assembly of claim 1 wherein the thin layer of material comprises a tape glued to the upper edge of the expansion joint strip.

6. The expansion joint assembly of claim 5 wherein the tape is ethylene.

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