

**TECH NOTE**

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## **Waterproofing of Periodically Moving Cracks and Joints Using Xypex Products**

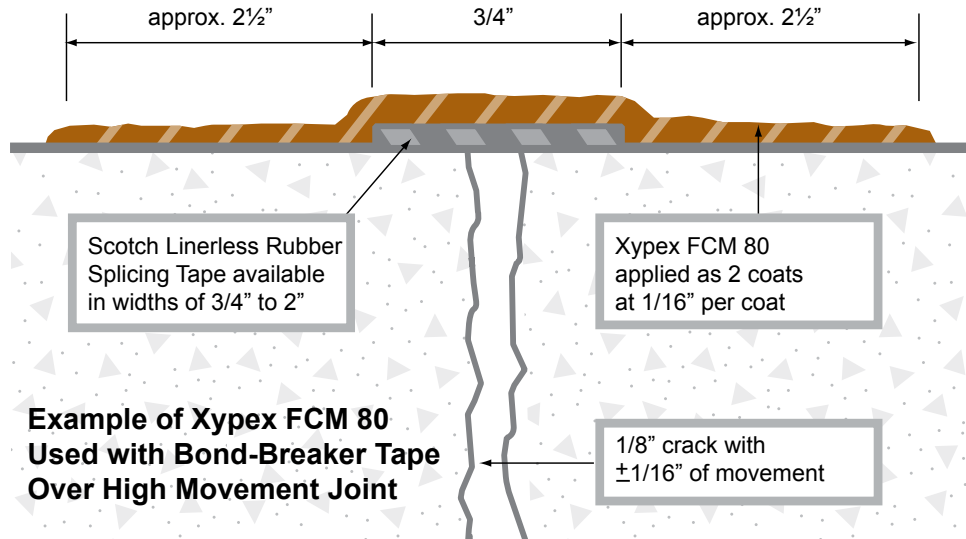
Xypex Crystalline Technology is excellent for reducing the water permeability of concrete and for the healing of leaking, non-moving cracks and joints in concrete structures. Xypex crystals will bridge most non-moving cracks up to 0.4 mm (1/64"). In situations where the cracks are larger (more than 0.4 mm but less than 3 mm (1/8")), the Xypex chip-and-pack method is used to form a 'plug' at the top portion of the concrete cross section, and the Xypex crystallization process heals any crack that may telegraph up through the repair. (Note: while it is not promoted, Xypex is aware of field reports that show the crystalline healing of cracks that are significantly larger than 0.4 mm and have not been routed or packed.)

However, cracks subject to ongoing movement or to periodic movement (where short-term weeping or leakage is unacceptable) can be problematic for crystalline-based healing. In these circumstances, Xypex FCM 80 can be used to stop water leakage. Tests have confirmed that Xypex FCM 80 will give 20% - 40% "elongation to break". This means that the material will stretch between 20% and 40% of its un-bonded length prior to breaking. Therefore, if FCM 80 is applied over a 0.4 mm (1/64") crack, it will accept up to 0.16 mm (0.006") of ongoing movement without rupturing.

In situations where there is greater than 20% to 40% movement or an unsupported width of more than 0.4 mm (1/64"), we recommend using a thin, flexible rubber tape such as "Scotch Linerless Rubber Splicing Tape" as a bond-breaker. This tape is placed over the crack before the FCM 80 is applied. The diagram below illustrates a typical 19 mm (3/4") bond-break tape assembly, using FCM 80 over a 3 mm (1/8") crack that has 1.5 mm (1/16") of movement over its width.

**Note:** A crack with +/-0.75 mm (1/32") of movement over its neutral position is deemed as having 1.5 mm (1/16") total movement since the crack's actual position is unpredictable at the time of installation of the assembly.

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The Scotch Linerless Rubber Splicing Tape is sticky enough to bond and hold to the concrete substrate during the FCM 80 application but will de-bond when movement of the crack occurs. The tape remains affixed to the FCM 80 and is flexible enough not to impede or interfere with the elongation of the FCM.

In this assembly you can conservatively expect 10% movement capability over the width of the tape. This tape is manufactured in widths of 19, 25, 38, and 50 mm (¾, 1, 1.5 and 2 inches). Hence, movement capabilities of an FCM 80 bond-breaker tape assembly using each of the widths indicated would be 2, 3, 4 and 5 mm (0.08, 0.1, 0.15, and 0.2 inches) respectively. The assembly must be made using one piece of tape only to span the entire width of the movement section (i.e. you cannot use two pieces of tape side by side; this would have the effect of concentrating the stress and movement at the tape joint and impact movement capability).

When concrete is under continual contact with water (eg. water-holding tanks or foundation walls subject to constant hydrostatic pressure), FCM 80 in a negative side application is not recommended for holding back the water. However, it can be used on the negative side to contain water over the short-term while the Xypex crystals form and mature to heal any cracks. For example, FCM 80 can be used as a final capping over chip-and-pack crack repairs that are expected to weep during the time required to empty and refill a tank. It can also be used over cracks that have not been repaired but are expected to heal from a Xypex Admix or Coating application and where weeping through such cracks during the crystallization process is unacceptable. Any water that gets trapped behind the FCM 80 membrane will eventually escape through the concrete as vapour.

In summary, Xypex FCM 80 is an effective solution for the waterproofing of cracks and joints that experience ongoing movement, and the elongation inherent in FCM 80 can be extended through the use of a bond-breaker tape assembly.