

Technical Bulletin #

429A

## Introduction

The treatment of joints or cracks in concrete before applying coatings and resurfacers is an extremely important step from both aesthetic and performance points of view. Improper problem identification, and improper product recommendation or application can lead to appearance problems or even premature joint failure. Proper treatment, however, can provide a solution to many types of existing or anticipated situations. This technical bulletin is intended to serve as a guide for treatment of such situations in typical interior industrial applications. It should be noted that secondary containment, exterior, or waterproofing projects can have different performance criteria and different specifications may apply.

Most types of joints or cracks can be broken down into two categories: Those that move and those that don't. There are many different kinds of problems: Including surface cracks, hairline cracks, settlement cracks, control joints, expansion joints and damaged joints, but the fundamental question that should be asked is – Will there be substantial movement? The answer will, many times, dictate both preparation and product recommendation. Movement can be caused by the following factors: Shrinkage during cure, settlement of the pad, changing loads, or temperature fluctuations. We will address each type of joint or crack for both moving and non-moving situations in the following outlines.

## Surface Cracking

This type of crack is sometimes called spider webbing and it is usually associated with concrete that was poured under adverse conditions (i.e., extremely cold or hot) or concrete that had incorrect moisture content. These cracks are generally very shallow [under .03" (762 microns)] and do not penetrate into the slab. They do not move after the concrete is cured and they can usually be treated with a high build coating that is thick enough to cover the imperfections.

## Hairline Cracks

This type of crack is a more severe form of surface crack and is usually formed while the concrete is shrinking during the cure. The crack may penetrate into the slab but usually does not extend through it. Again, this type should not see any movement after cure. The treatment involves either filling the fissure with a hard setting putty such as IMPAX Crack Filler prior to coating or using a high build system applied in multiple coats that will initially seal the crack and then cover it. The width, depth, and frequency of the cracks will help determine which system to use.

## Settlement Cracks

This type of crack is usually formed when the fill material under the pad settles or is otherwise caused to shift. The slab then drops and a subsequent cracking occurs. If the problem was caused by initial natural settlement of the fill and the crack does not appear to be growing, a hard setting material (such as IMPAX Crack Filler) can be used for repair after proper preparation. If the building is still new and may still be setting or if the cracks continue to show widening, a flexible material such as IMPAX Flexible Joint Sealant should be used to repair the condition. It should be explained that if a rigid coating is then applied, a break may develop in the coating. This may occur even if a flexible topcoat is used. A crack may also develop either in the concrete or in the repair material itself if movement is too great. It should always be noted that no major structural problem such as continual movement of a slab can be solved with a coating or topping.

## Control Joints

This type of joint is intentionally installed in the new concrete as a way to control the cracking caused by shrinkage during cure. The joint is either saw cut or formed into the concrete to create a uniform "break line" where the slab can intentionally crack (see drawing 1A).

The resulting fissure almost always runs through the pad and has the potential to move, especially if the loads on the surface vary as with forklift traffic. A rigid filler can be applied to the joint only under the following circumstances: The pad has completely cured and does not show signs of settlement; there are no great temperature fluctuations; traffic is not extremely heavy (see drawing 1B). If any of these conditions are not met, a flexible or semi-rigid material should be used to repair the joint. With a flexible material, the procedure used to treat settlement cracks can be used for control joints. The joint may also be treated (sealed) after the coating has been applied. This is usually aesthetically acceptable because of the uniformity of control joints in a floor (see drawing 1C).

## Expansion Joints

This type of joint is formed when the floor is being poured and is normally a gap of 1/4" to 3/4" between pads. It is designed to compensate for movement between large slabs or between pads and structural "footers" and should always be treated as a moving crack (see drawing 2A). When coating a floor with expansion joints, the usual practice is to clean the joints out during preparation, coat the floor and then apply a flexible joint sealant into the crack per instructions (see drawing 2B). If a resurfacing product or topping is used, follow the same procedure – except the joint should be filled with the resurfacing material and then saw cut after cure. Next, apply a flexible joint sealant (see drawing 2C). When dealing with a joint that is damaged because of high impact traffic or because of a different level between the pads, the following procedure should be used. First, level the area off by planning or scarifying the high pad down to the level of the low pad if necessary. Run a saw cut 2" to 6" on either side of the joint approximately 1/2" to 3/4" deep. Then chip the concrete out up to the saw cut. Apply a hard setting material such as IMPAX 5020 or IMPAX Crack Filler into the joint per instructions and after the material has cured, cut a control joint 1/8" to 1/4" wide about halfway through the material. Then fill the saw cut with a flexible joint sealant (see drawing 2D).

The treatment of joints and cracks can be somewhat more complex than we have covered here. However, this technical bulletin provides a basic background on the causes and treatments for these situations. If in doubt about a particular project, please contact our Technical services department.

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