

- a. The maximum joint spacing should be 24 to 36 times the thickness of the slab. For example, in a 4-inch [100 mm] thick slab the joint spacing should be about 10 feet [3 m]. It is further recommended that joint spacing be limited to a maximum of 15 feet [4.5 m].
- b. All panels should be square or nearly so. The length should not exceed 1.5 times the width. Avoid L-shaped panels.
- c. For contraction joints, the joint groove should have a minimum depth of $\frac{1}{4}$ the thickness of the slab, but not less than 1 inch [25 mm]. Timing of jointing operations depends on the method used:
 - Preformed plastic or hard board joint strips are inserted into the concrete surface to the required depth before finishing.
 - Tooled joints must be run early in the finishing process and rerun later to ensure groove bond has not occurred.
 - Early-entry dry-cut joints are generally run 1 to 4 hours after completion of finishing, depending on the concrete's setting characteristics. These joints are typically not as deep as those obtained by the conventional saw-cut process, but should be a minimum of 1 inch [25 mm] in depth.
 - Conventional saw-cut joints should be run within 4 to 12 hours after the concrete has been finished.
- d. Raveling during saw cutting is affected by the strength of the concrete and aggregate characteristics. If the joint edges ravel during sawing, it must be delayed. However, if delayed too long, sawing can become difficult and uncontrolled cracking may occur.
- e. Use premolded joint filler such as asphalt-impregnated fiber sheeting, compressible foam strips, or similar materials for isolation joints to separate slabs from building walls or footings. At least 2 inches [50 mm] of sand over the top of a footing will also prevent bond to the footing.
- f. To isolate columns from slabs, form circular or square openings, which will not be filled until after the floor has hardened. Slab contraction joints should intersect at the openings for columns. If square openings are used around columns, the square should be turned at 45 degrees so the contraction joints intersect at the diagonals of the square.
- g. If the slab contains wire mesh, cut out alternate wires, or preferably discontinue the mesh, across contraction joints. Note that wire mesh will not prevent cracking. Mesh tends to keep the cracks and joints tightly closed.
- h. Construction joints key the two edges of the slab together either to provide transfer of loads or to help prevent curling or warping of the two adjacent edges. Galvanized metal keys are sometimes used for interior slabs, however, a beveled 1 by 2 inch [25 by 50 mm] strip, nailed to bulkheads or form boards, can be used in slabs that are at least 5 inches [125 mm] thick to form a key which will resist vertical loads and movements. Keyed joints are not recommended for industrial floors. Metal dowels should be used in slabs that will carry heavy loads. Dowels must be carefully lined up and parallel or they may induce restraint and cause random cracking at the end of the dowel.
- i. Joints in industrial floors subject to heavy traffic require special attention to avoid spalling of joint edges. Such joints should be filled with a material capable of supporting joint edges. Manufacturer's recommendations and performance records should be checked before use.

References

1. *Joints in Concrete Construction*, ACI 224.3R, American Concrete Institute, Farmington Hills, MI.
 2. *Guide for Concrete Floor and Slab Construction*, ACI 302.1R, American Concrete Institute, Farmington Hills, MI.
 3. *Slabs on Grade*, ACI Concrete Craftsman Series CCS-1, American Concrete Institute, Farmington Hills, MI.
 4. *Joint Planning Primer*, Concrete Construction, August 1997.
 5. Bruce A. Suprenant, *Sawcutting Joints in Concrete*, Concrete Construction, January 1995.
-

Follow These Rules for Proper Jointing

1. Plan exact location of all joints, including timing of contraction joint sawing before construction.
2. Provide isolation joints between slabs and columns, walls and footings, and at junctions of driveways with walks, curbs or other obstructions.
3. Provide contraction joints and joint filling materials as outlined in specifications.