Guidelines:
- interior—20° to 25° in each direction.
- exterior—8° to 12° in each direction.
- interior tilework exposed to direct sunlight or moisture—8° to 12° in each direction.
- where tilework abuts restraining surfaces such as perimeter walls, dissimilar floors, curbs, columns, pipes, ceilings, and where changes occur in backing materials, but not at drain strainers.
- all expansion, control, construction, cold, and seismic joints in the structure should continue through the tilework, including such joints at vertical surfaces.
- joints through tilework directly over structural joints must never be narrower than the structural joint.

Expansion Joint Width (Vertical and Horizontal):
- exterior (all tile)—minimum 3/8” for joints 8’ on center, minimum 1/2” for joints 12’ on center. Minimum widths must be increased 1/16” for each 15°F tile surface temperature change greater than 100°F between summer high and winter low. (Decks exposed to the sky in northern U.S.A. usually require 3/4”-wide joints on 12’ centers.)
- interior for quarry tile and paver tile—same as grout joint, but not less than 1/4”.
- interior for ceramic mosaic tile and glazed wall tile—preferred not less than 1/4”, but never less than 1/8”.

Preparation:
- tile edges to which the sealant will bond must be clean and dry. Sanding or grinding of these edges is recommended to obtain optimum sealant bond.
- primer on these tile edges is mandatory when recommended by the sealant manufacturer. Care must be taken to keep primer off tile faces.

Materials:
- backup strip shall be a flexible and compressible type of closed-cell foam polyethylene, butyl rubber, or open cell and closed cell polyurethane, rounded at surface to contact sealant, as shown in details above, and as recommended by sealant manufacturers. It must fit neatly into the joint without compaecting and to such a height to allow a sealant depth of 1/2 the width of the joint. Sealant must not bond to the backup material.
- suitable sealants include silicone, urethane, and polysulfide. Generally, urethane sealants are recommended for exterior vertical tile surfaces and both exterior and interior horizontal tile surfaces, including tiled traffic areas. Sealants in traffic areas require a Shore A hardness of 35 or greater.
- silicone sealants may be used on both exterior and interior vertical tile surfaces. Single-component, mildey-resistant silicone sealants are formulated with fungicide for sealing interior joints in ceramic tile showers and around tubs, sinks and plumbing fixtures.
- use sealants complying with ASTM C920, which designates sealants according to Type, Grade, Class, and Uses. The following are suitable for use in tilework:
  - Type S—single-component sealant.
  - Type M—multicomponent sealant.
  - Grade P—sealants for joints on horizontal surfaces.
  - Grade NS—non-sagging sealants for joints in vertical surfaces.
  - Class 25 and 12½—identifies sealants which can withstand an increase and decrease of +/-25% or +/-12½% of joint width.
  - Use T—use in joints subjected to pedestrian and vehicle traffic.
  - Use NT—sealants for non-traffic exposures.
  - Uses M and G—sealants that will remain adhered to mortar (M) and glass (G) are suitable for use with tilework.
  - some sealants require edge priming. Consult manufacturer’s specifications.
  - manufactured/preformed joint profiles are available. Consult manufacturer.

Cold Joints:
- cold joints are formed primarily between slab pours where the size of a concrete slab may be too large to be poured at one time. The remainder of the slab would be poured at a later time, forming a cold joint between the two sections. Such joints should be shown on architectural drawings.
  - a cold joint becomes a weakened joint that, upon movement, will crack, permitting leakage or buckling and cracking of a tile floor set over the slab.
  - some large slabs on-grade are poured monolithically, then later saw-cut at intervals, providing control/contraction joints to allow for cracking at these weakened points.

Installation:
- movement joints in tile should be located over all cold joints and saw-cut control joints.
- joints in tile and setting materials shall never be less than the width of the saw-cut control joint width. Preparation and installation shall be as required for movement joints.
- to insure that location of joints in tilework align with existing joints in substrate, joints in tilework should be constructed during installation of mortar beds and/or tile, rather than saw-cutting joints after installation.
- keep movement joint cavities open and free of dirt, debris, grout, mortar, and setting materials.
- set compressible backup strip when mortar is placed or utilize removable wood strip to provide space for backup after mortar has cured.
- install sealant after tilework and grout are dry. Follow sealant manufacturer’s recommendations.
- saw-tooth joints affect the performance of sealant and caulking materials and are not recommended unless used with a crack isolation membrane.
- refer to sealant section in ANSI tile installation specification.

NOTES: Preparation of openings left by the tile contractor and installation of backup strip and sealant should be specified in the Caulking and Sealant section of the job specification.

The performance requirements of certain special locations, such as exterior swimming pools, dairies, food plants, etc., may exceed the minimum requirements of the sealant specifications given above. Therefore, follow recommendations of experienced manufacturers as to specific sealants suitable in the job environment. In some severe environments, a program for regular maintenance of sealant in joints may be required.
MOVEMENT JOINTS-VERTICAL AND HORIZONTAL

It is not the intent of this guide to make movement joint recommendations for a specific project.

Continued from previous page.

Use These Details for Contraction, Control, Expansion, and Isolation Joints (Ref. page 7).

Expansion Joint - EJ171C

Expansion Joint - EJ171

Isolation/Expansion Joint - EJ171D

Expansion Joint, Cement Mortar Bonded - EJ171E

Expansion Joint, Cement Mortar, Cleavage Membrane - EJ171H

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Use These Details for Contraction, Control, Expansion, and Isolation Joints (Ref. page 7).