The benefits of the Octodowel ® explained

How to construct failure free joints in concrete slabs on grade

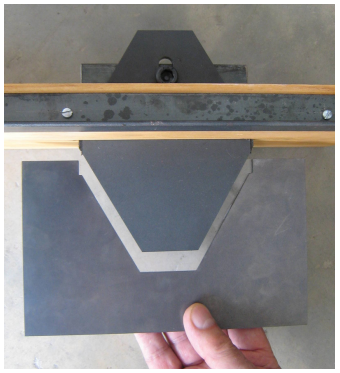
Why construction joints fail

Stress concentration under traffic is the main reason for construction joint failure. Round dowels are no longer recommended by the American Concrete Institute (ACI Committee 302.1R-04).

Slot and accessory kit

Why round dowels are problematic

Lack of accurate and stable installations are a prime cause of non-performance of round dowels. Worker boots and vibration of concrete often misalign originally correctly placed dowels. The Octodowel unique positioning device and tight locking system ensures accurate alignment.



Positioning device

Shutter edge

Improper shuttering contributes to joint failure since the shutters may not have a properly defined construction joint edge. Easily overcome this by the simple placing of a 25mm angle iron onto the leading edge of a shutter. The slot needed to accommodate the Octodowel is easily created with a simple router. (See illustration). Reusable Accessory kits, complete with a locating bolt, are supplied with the dowels.

Tightening position

Moulded slot

The Octodowel ensures accurate moulding of the slot required for re-insertion of the dowel at the edge of the first placed slab. Thereafter, the positioning slot serves as a one-sided lock of the dowel into the second placed slab. (This obviates so-called “stitching” often encountered with misaligned round dowels). The procedure is simple. After accurate location of the dowel using the unique patented positioning device, a bond breaker allows easy removal and replacement of the dowel for the stripping of the shutter, and provides a tight fit without the possible complication of embedded plastic slots.

Dowel removal for shutter stripping

Engineers' quality check

The positioning device can also be used by supervising engineers to ensure that the contractor has correctly aligned the dowels. (This cannot be done with a round dowel). A competent flooring specialist will easily master the simple steps for installation of the Octodowel.

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Two way dowelling

The Octodowel is supplied with a rubberized strip on each side and this enables dowling to take place on the longitudinal side of a slab and also across the stop-end.

Treating curling

Dependant on many factors including slab dimensions, curling may occur at the free ends. This will be evidenced by hollow spots under the construction joint. If detected, these should be underpinned by the use of either a super fine void filler, or low viscosity epoxy to provide resistance to fatigue due to dynamic loading.

Spacing of dowels

Based on *ACI Committee 302.1R-04* recommendations in a 150mm thick slab, the plate dowels should be installed at 450mm centers.

Shear stress resistance

The shear stress resistance of the Octodowel exceeds the tensile resistance of the cover concrete. The conclusion of this is that the concrete under stress will fail, but not the dowel. Compared to a "diamond" dowel, the Octodowel has superior stress distribution.

Additional techniques needed for smooth load transfer

- The natural meniscus formed in the plastic phase at a shutter edge must be eliminated (this is done by using a wood float to depress the meniscus and then applying a dry shake hardener to establish levelness of the hardening concrete).
- When the second slab is placed, a straight edge should be used to ensure that undulations in the first slab are accurately mirrored in the second slab.

Correcting meniscus

Joint filler for load transfer

- Saw-cutting at a construction joint must not be undertaken before the drying shrinkage crack is revealed so that the cut can be accurately placed.
- The saw-cut joint should be full-depth filled with minimum 60 ShoreD hardness joint filler.

Consultation

For further information regarding the efficacy of the Samson System, consult David Samson, the inventor and holder of the South African patent for the Octodowel System.

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