

# CONCRETE CORNER

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**Uses for Consolidating Concrete:**

- Bridges
- Pumped Concrete
- Utility Applications
- Repair Applications
- Hard to Reach Areas
- Structural Applications
- Architectural Applications
- Precast and Pre-stressed Concrete
- Areas with Congested Reinforcement, such as Columns and Walls

## SELF CONSOLIDATING CONCRETE AKA...SELF LEVELING, SELF COMPACTING CONCRETE

Self Consolidating Concrete (SCC) is a new class of high performance concrete. When SCC is properly proportioned and controlled, the fresh concrete will flow great distances and remain homogeneous.

**Characteristics of SCC:**

- High Slump
- Flowing Concrete
- High Strength
- Durable
- Workable

**What does SCC workability mean?** The ability to easily place concrete as it flows under its own weight, without segregation.

**First developed in Japan** in 1988 to reduce labor costs, by eliminating/reducing the need for vibration in placing concrete. The Japanese have used SCC in bridges, high rise

towers, highly reinforced columns and more.

Most industrial jobs have seen concrete pours where the maze of reinforcement bars make the placement of concrete almost impossible. Using the conventional concrete methods of vibrating, the results can be pocked with honeycombing because of the voids.

**What is SCC made of?**

- Cement
- Coarse aggregates (some restrictions on top size)
- Fine aggregates
- Water
- Chemical Admixtures

It is the Chemical Admixtures that gives SCC its ability to maintain a desirable water/cement ratio, without compromising strength loss



Self Consolidating Concrete

sometimes associated with high slump concrete. SCC is capable of reducing 30-40% of the mixing water by using superplasticizers/high-range water reducers. The superplasticizer optimizes the water/cement ratio, improving workability without having to add more water.

Normally when water is added to fresh concrete to increase workability, strength is greatly reduced. With SCC the strength can be increased while improving the workability at the same time.

## BENEFITS OF SELF CONSOLIDATING CONCRETE

- Self-Leveling
- Fills All Voids
- No Segregation
- Easy to Deliver
- Available Locally
- High Performance
- Improves Surface Finish
- Improves Productivity
- Improves Construction Schedule
- No Consolidation Needed
- **For the Architect:** Increases design flexibility and allows innovative techniques
- **For the Contractor:** Reduces Labor Costs, Reduces Equipment on the Jobsite, Improves Labor Safety, Shortens Construction Time, Reduces Overall In-Place Cost
- **For the Owners:** Faster Construction Time, Reduces Costs, Lower Maintenance Costs in Future with Improved Durability, More Design Options
- **For the Ready Mix Producer and the Precast and Pre-stressed Producer:** Improves Labor Safety, Reduces the need for Vibration and Related Costs, Ability to Produce Highest Quality Surface Finish, Increased design flexibility
- **Available Locally:** Contact your local Ready Mixed Concrete Producer for details

## SCC Other Sources:

Portland Cement Association (PCA)  
5420 Old Orchard Road  
Skokie, IL 60077  
847-966-6200  
www.cement.org

National Concrete Bridge  
Council (NCBC)  
c/o Portland Cement Association  
www.nationalconcretebridge.org

National Ready Mixed Concrete  
Association (NRMCA)  
900 Spring Street  
Silver Spring, MD 20910  
888-84NRMCA  
www.nrmca.org

American Concrete Institute (ACI)  
PO Box 9094  
Farmington Hills, MI 48333  
248-848-3700  
www.aci-int.org

American Society for Testing  
Materials (ASTM)  
100 Barr Harbor Drive  
PO Box C700  
West Conshohocken, PA 19428  
610-832-9585  
www.astm.org

High Performance Concrete (HPC)  
FHWA Headquarters  
400 7th Street, S.W.  
Washington, D.C. 20590  
202-366-0537  
<http://knowledge.fhwa.dot.gov/cops/hpcx.nsf/home>

Emerging Construction  
Technologies (ECT)  
Purdue University  
1294 Civil Eng. Bldg.  
West Lafayette, IN 47907 -  
Ph: +1 765 496 2742  
[www.new-technologies.org/ECT/Civil/flowconc.htm](http://www.new-technologies.org/ECT/Civil/flowconc.htm)

## TESTING & QUALITY CONTROL FOR SELF CONSOLIDATING CONCRETE

The American Society for Testing and Materials (ASTM) and the American Concrete Institute (ACI) are currently working on identifying proper Self Consolidating Concrete test methodology.

The characteristics of SCC, resistance to bleeding and segregation, high early and ultimate strengths as well as fluidity make this new creature in construction materials a little challenging to create uniform test methodology.

Slump testing, widely used for identifying the workability of concrete, is not applicable for SCC. It

has flow characteristics that the Slump Test doesn't currently measure properly.

One possible test method is the "Slump Flow" Test, which measures the slump creep in diameter. Such as 19" creep or 26" creep.

Another suggested test method is the "U-Flow" Method. This test simulates the flow of concrete through a volume containing reinforcing steel.

Other test methods include the "V-Flow", "L Flow", "J-Ring", "V-Funnel", flow box and rheometers.



Flow Box



Slump Flow Test



U-Flow Test

Multiple SCC References found at: <http://ciks.cbt.nist.gov/~garboecz/materialscience2000/node15.htm>

*Dedicated to Quality Concrete*

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[www.concretepromotion.com](http://www.concretepromotion.com)

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