

MPA Cement Fact Sheet 5

## Self compacting concrete (SCC)

### Introduction

Self-compacting concrete (SCC) was developed in Japan in the late 1980's and allows concrete to be placed fully compacted without segregation and with no additional compactive effort such as internal or external vibration. It currently makes up about 5% of the Japanese concrete market and around 15% of the Danish and Swedish markets. SCC has economic, social and environmental benefits over conventionally vibrated concrete offering faster construction times, increased workability and ease of flow around heavy reinforcement. Having no need for vibrating equipment, it spares workers from exposure to vibration and no vibration equipment also means quieter construction sites. The uptake of SCC technology within UK has grown rapidly in recent years particularly in precast concrete factories but less quickly in in-situ construction.

### What is different about SCC?

SCC is made from the same basic constituents as conventional concrete but with the addition of high levels of superplasticising admixtures to impart high workability and where necessary viscosity-modifying (anti-segregation) admixtures. The powder content of the concrete is relatively high, typically up to around 500 kg/m<sup>3</sup>, where the powder may be cement or any combination of cement, additions and other very fine material such as ground limestone. The ratio of fine to coarse aggregates is increased, with fine aggregate often making up more than 50% of the total aggregate fraction.

The fluidity of SCC ensures a high level of workability and durability whilst the rapid rate of placement helps provide an enhanced surface finish where used with the appropriate formwork sheeting materials. SCC's overnight strengths typically reach 30-40N/mm<sup>2</sup> and two-day strengths can break the 100N/mm<sup>2</sup> barrier which enables easier and more reliable de-moulding.

### Why is SCC not more widely used?

SCC is currently a high cost material and is often sold as a special proprietary material where its performance is typically guaranteed by the concrete manufacturer.

### Availability

Due to the specialised materials required to make high performance SCC it may not always be immediately available from all ready-mixed concrete suppliers so it is prudent to pre-order with a few days notice.

### Where can I find out more?

Contact: Dr Chris A Clear at BRMCA, Tel: 07976 546941, [chris.clear@mineralproducts.org](mailto:chris.clear@mineralproducts.org).

### Further reading

BS EN 206-9: 2010. *Additional rules for self-compacting concrete (SCC)*. [This will be merged into a new 'EN 206' during revision of EN 206-1]

The European Project Group. *The European Guidelines for self-compacting concrete (SCC). Specification, production and use*. May 2005.

The Concrete Society. *Self-compacting Concrete: A review*. Report of a joint Working Group of The Concrete Society and the Building Research Establishment, Technical Report 62. June 2005.

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Document ST/FS/5	No:	Revision No: 2
Author: C A Clear		Drafted: April 2006  Last revised: 25 March 2013