Super-Plasticizing Chemical Admixture Re-dosing Procedure

American Concrete Institute's (ACI) Recommendation on Re-dosing of Chemical Admixture

"Concretes containing high-range water reducers often have shown rapid slump loss. To overcome this, a second dosage of high-range water reducer may be used to restore the slump without any apparent ill effects. Generally, more than two dosages are less effective and concrete may lose its workability faster than with a single dosage.

It has been found that redosage may result in an increase or decrease in air content on the order of 1 to 2 percent for each redose. When redosages are used, the concrete may experience a greater potential for bleeding, segregation, and possible set retardation. Therefore, trial mixtures should be conducted to determine the effects of redosing."

Re-dosing Procedure

It must be noted that the period within which re-dosing is effected, shall not be more than the duration stipulated for concrete consumption, as determined and agreed earlier. Hydration (Main) can commence as soon as retarding effect of admixture is withdrawn and re-working of concrete beyond this period shall not be practiced. Concrete mixes with High OPC content and high ambient temperature can influence second main peak of hydration. However, mixes containing Fly Ash and GBBS will have delayed and slow hydration process.

Only trained personnel shall carryout the re-dosing at site.

Re-dosing amount, process shall be coordinated by the competent and authorised personnel of the concrete manufacturer.

Re-dosing amount shall be in percentage to total Binder Content / cum
(Example for mix having 400kg Binder per cum, amount of super-plasticizer to be re-dosed for a dosage of 0.10% be 400*0.10/100 = 0.40 kg/cum).

It is advisable to perform the re-dosing before workability of concrete becomes too low that mixing and dispersing of re-dosed super-plasticizer in the entire volume of concrete available in the truck mixer drum becomes difficult.

Normally re-dosing is preferred to be carried out when slump value of the concrete mix is about 80 to 100mm. However, it has been reported that when PCE based admixtures are used workability can be enhanced from low slump value of about 50mm, provided thorough mixing is done @ appropriate speed and duration.

Mixing of concrete after re-dosing shall be done for at least 3 minutes @ 11 RPM (TM drum's). This is to ensure that the admixture is mixed with the entire drum load and the mix is homogeneous.

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The amount of re-dosing shall be determined by the Quality Control personnel of the concrete manufacturer based on the type of mix, volume of concrete in the transit mixer and climatic condition.

Total amount of admixture added to concrete, including re-dosed quantity, shall not exceed the maximum percentage limit prescribed the admixture manufacturer.

The details like reason for re-dosing, approximate amount of concrete required re-dosing, amount of admixture re-dosed, time, Truck/Batch number, etc shall be recorded.

It is advisable to cast cube specimen to verify the strength of concrete re-dosed with super-plasticizer to ensure that the strength is not affected by re-dosing.

Non-retarding super-plasticizer is found to be more suitable to avoid delay setting of concrete when re-dosing is done, especially in mixes having Fly Ash or GGBS. However, consumption of concrete after re-dosing shall be done as early as possible as workability would drop drastically.

RMC manufacturer shall have a approved re-dosing chart for different types of concrete mixes for each type of Super-Plasticizing admixture used. Such a chart could be used as a guideline during re-dosing.

Admixture Re-dosing Record										
TM number	Batch Time	Grade & Binder Content	Time of re-dosing	Current slump & Target Slump	Admixture used for re-dosing	Re-Dose amount required	Slump of concrete after re-dosing	Appearance of concrete uniformity	Cube sample IDs	Signature of rmc personnel and customer