

Protocol for Lab Trials

Preparation Stage:

- Take 30 Kg clinker, 5 Kg gypsum, 20 Kg fly ash and 20 Kg slag samples. Homogenize each sample.
- Make up four samples each of 5 Kg (or of the available laboratory ball mill capacity) with the
 proportionate quantities of clinker, gypsum and extender (fly ash for PPC; fly ash + slag for
 Composite Cement).
- Grinding Aid preparation: Shake the samples well to make it homogenous and to ensure there is no segregation.

Grinding Stage:

- Grind one batch of clinker, gypsum, fly ash and/or slag without Grinding Aid until the desired Blaine is achieved
 - Note time taken while mill is operating to achieve this fineness
 - Measure blaine and residue
 - Make mortar cubes and test for compressive strength across different ages
- Add the next batch to the mill and add @ recommended dosage by mass of the sample of prepared Grinding Aid
 - Stir the Grinding Aid solution before removing the sample for addition to the mill.
 - Grind for the same time as the blank sample
 - Remove this sample after the required time and measure Blaine and residue.
 - Make mortar cubes and test for compressive strength across different ages
- Add the next batch to the mill and add @ 120% of the recommended dosage by mass of the sample of prepared Grinding Aid
 - Stir the Grinding Aid solution before removing the sample for addition to the mill.
 - Grind for the same time as the blank sample
 - Remove this sample after the required time and measure Blaine and residue.
 - Make mortar cubes and test for compressive strength across different ages
- Add the next batch to the mill and add @ 80% of the recommended dosage by mass of the sample of prepared Grinding Aid
 - Stir the Grinding Aid solution before removing the sample for addition to the mill.
 - Grind for the same time as the blank sample
 - Remove this sample after the required time and measure Blaine and residue.
 - Make mortar cubes and test for compressive strength across different ages

<u>Results:</u>

- Record the following parameters for all samples:
 - Chemical analysis with CaO, LOI, SiO2, SO3, IR, etc.
 - Physical analysis with blaine, residue and NC
 - IST and FST in minutes
 - Compressive strengths across all ages