

## **FEBFLOW RETARDING**

### **RETARDING GRADE WATER REDUCING AGENT**

#### **Description:**

FEBFLOW RETARDER is basically the same as FEBFLOW STANDARD but contains additional chemicals to delay the setting time of the cement without prejudice to the strength of the mix at the usual ages of testing (3, 7 and 28 days). Febflow Retarder is a brown liquid (S.G about 1.20 and contains no chlorides or nitrates). FEBFLOW RETARDER complies with NZS 3113 Type WRE.

#### **Primary Uses:**

The effects of FEBFLOW RETARDER which are derived from results of actual and representative test conditions are illustrated in the diagram.

From the graphs and compressive strength data it can be concluded that -

1. The initial (and therefore final) setting times of the cement and the vibration limits of the concrete are extended by amounts dependent on the dosage of FEBFLOW RETARDER.
2. The compressive strengths at 7 and 28 days in all cases are increased by the use of FEBFLOW RETARDER. This is made possible by the fact that:
  - (a) FEBFLOW RETARDER enables the water content to be reduced for the same workability, and
  - (b) The rate of strength development after the initial setting time has been reached proceeds the same in the retarded as in the non-retarded (control) mixes.
3. The amount of retardation is affected by:
  - (a) The temperature of the concrete and
  - (b) The characteristics of the cement.

The retarding effect shown in the diagram is confirmed by experience on the site but has the peculiarity of not necessarily being supported by the evidence of conventional workability measurement tests such as slump and compacting factor. What is important is that in practice FEBFLOW RETARDER does prolong the workability of concrete and allows a longer period to elapse between mixing and placing than would otherwise be possible.

#### **Typical Applications:**

Amongst the most useful applications of FEBFLOW RETARDER are: --

1. To prevent cold joints in large pours.
2. To enable concrete to be transported over long distances.
3. As an insurance against the effects of delays after the concrete has been mixed and before it is finally compacted.
4. To keep concrete "live" so that vibration transmitted through reinforcing the steel does not reduce the bond between the steel and the lower lifts of the pour.
5. To off-set the effects of high ambient temperatures by: --
  - a. ensuring a satisfactory surface finish by minimising drying out caused by direct sunlight and wind.
  - b. Retaining the plastic properties of the mix over a longer period.
  - c. Allowing the height of lifts to be increased. (The effect of added pressure on formwork should be taken into account)
6. To reduce the rate of liberation of heat of hydration (the total quantity is unchanged).

NOTE – In addition to the retarding properties of FEBFLOW RETARDER, since it is also a water-reducing agent, it will either –

- a. Increase workability if no adjustment is made to the mix proportions.  
OR
- b. Increase strength if water is reduced to give the same workability as the corresponding plain mix OR
- c. Enable a 10-15% cement reduction to be made to give workability and strength equal to a corresponding plain mix.

**Compatibility:**

FEBFLOW RETARDER may be used with most types of Portland cement, including the sulphate-resisting type. With other types of cement, test mixes should be prepared to ensure that no undesirable secondary effects are caused. The Feb Technical Service Department will advise and give recommendations where circumstances are unusual. The incorporation of FEBFLOW RETARDER in concrete will have no deleterious effects on reinforcing steel, prestressing tendons or other metallic ancillaries.

On no account should FEBFLOW RETARDER be mixed with FEBCRETE A.E.A or any other type of admixture. When FEBFLOW and FEBCRETE are required to be used in the same mix, the dispensing systems must be kept separate.

**Dosage:**

The amount of retardation depends on the dosage of the admixture. The required condition will usually be obtained by using 140ml per 50kg cement or 0.34% by weight of cement. In abnormally hot conditions up to twice this quantity may be found necessary. No harm will result from reasonable over dosage but the effects of delayed set and greater workability will be increased.

Add FEBFLOW RETARDER to the mixing water or to the batch of sand.

**Types:**

FEBFLOW RETARDER is available in standard and air-entraining grades. The standard grade does not entrain air in the mix, whereas the air-entraining grade may increase the air content by 2% to 3%. In those cases where it is desired to avoid additional air the standard grade is recommended.

**Packaging:**

Febflow Retarder is available in 5, 20 and 200 litre containers.

**Storage:**

Will freeze but can be reconstituted by stirring after thawing.

**AGITATE WELL BEFORE USE.**