

Name :: Fainad Gul

ID :: 7373

Sec :: B

Subject :: Concrete Technology.

Submitted to :: Engr Usama Ali

CONCRETE TECHNOLOGY

Q1. Which step is taken to prevent Flash setting of cement? Also, write to prevent False setting of concrete?

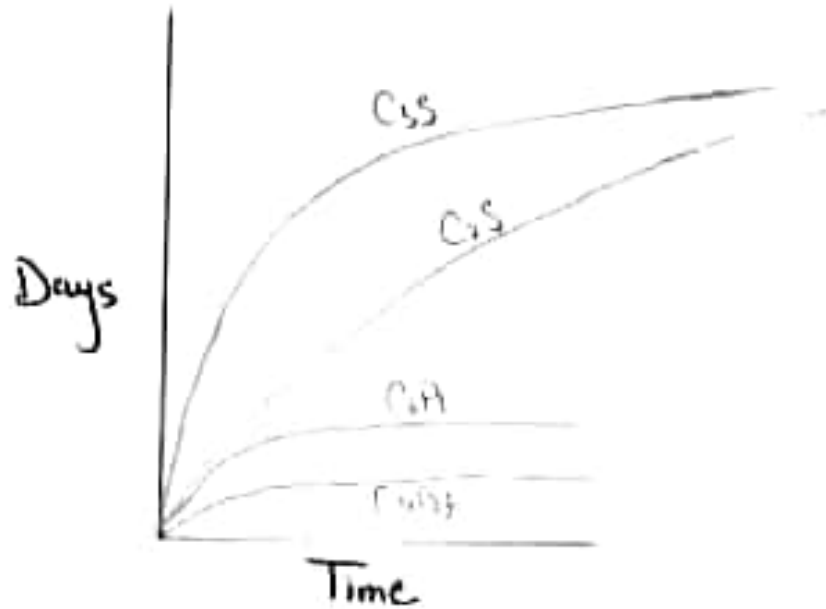
✓ FLASH SETTING:-

- This is quick setting and it is not desired.
- This occurs due to reaction of C₃A with water.
- This is prevented by addition of gypsum.

✓ FALSE SETTING:-

- This is pre-mature stiffening of cement paste, within few minutes after mixing cement with water.
 - It can be prevented by remixing the paste without addition of any water and without any loss in strength.
-

Q2 Draw a graph showing the strength development of pure compounds of cement?



→ C₃S and C₂S mainly contribute to the strength. C₃S is mainly responsible for early strength within few days, where C₂S is responsible for later strength while C₃A and C₄A contribute very little. It has reported at age of 7 days C₂S has no strength, while C₃S has strength about 40 MPa.

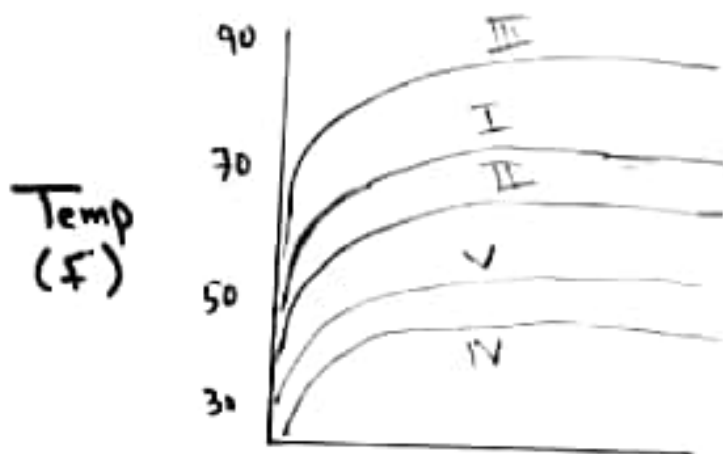
3 Why type III cement is Rapid hardening and type IV low heat producing? Draw a graph showing the development of heat of hydration of different cement types?

▶ TYPE III CEMENT:-

- It is known for high early strength.
- Three-day compressive strength of Type III cement is equal to 7-day strength of type II & I.
- It gives high strength due to 57% of C_3S and small amount of increasing gypsum level.

▶ TYPE IV CEMENT:-

- They are used in mass concrete.
- Because of limiting C_3A percentage to 7% & C_3S to 35, it will cause of low heat of hydration



Q4 what is the effect of compaction on entrapped air of concrete? what will be the effect on strenght if concrete is not compacted sufficiently?

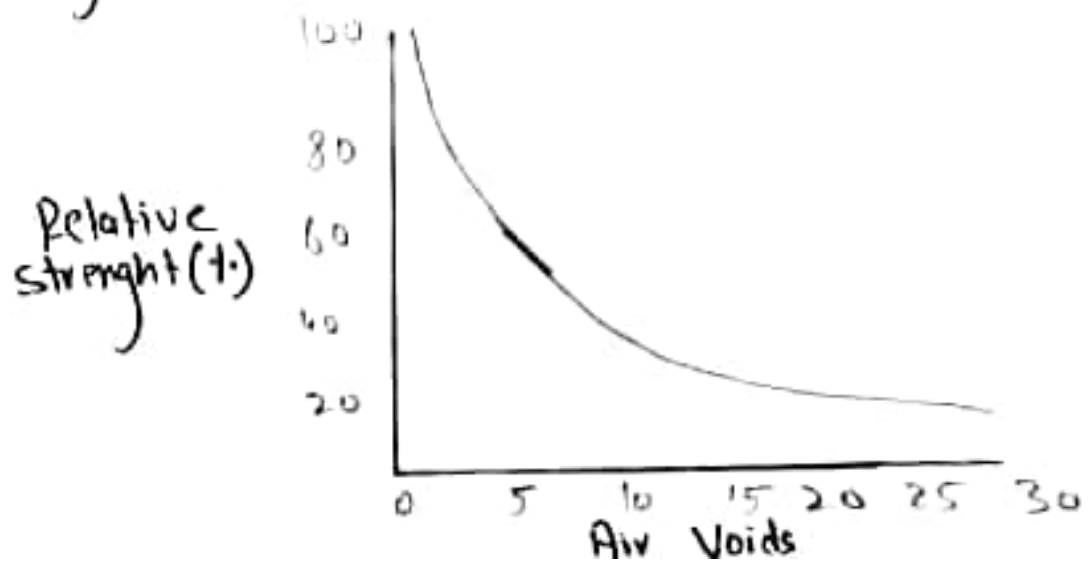
➤ Increase compaction will reduce the amount of air entrapped in concrete.

→ when concrete is compacted air voids are reduce hence more strenght will be achieve.

1 STRENGHT OF CONCRETE IF NOT PROPERLY COMPACTED:-

→ If concrete is not properly compacted air voids will be present in great amount

→ The presence of air voids reduces the strenght of concrete



Q Why is the percentage of gypsum added to cement limited only to 5%?

- Gypsum plays an important role in controlling hydration.
- It is added & limited to 5% to control the setting time.
- As mixing water with cement, CSA reacts with water & harden, so concrete doesnot allow time for transporting, placing & mixing.



Q. What is the effect of following on bond strength?

✓ SHAPE :-

- ~~blended~~ ^{Rounded} gravel concrete gives less strength than
- rough angular crushed aggregate.
- This is due to the bond strength is greater, if angular aggregates are used.

✓ SIZE :-

- It also affects bond strength.
- Greater the max size of aggregate less water will be required. So w/c will be

* COARSE AGGREGATE TO FINE AGGREGATE RATIO:-

→ Increasing coarse aggregate to fine aggregate ratio less will be workability as it required more water.

* GRADING OF AGGREGATE:-

→ Grading also effects the workability. Very coarse sand produce harsh and unworkable concrete.

* Q8.. What is the effect of fineness of cement on the following?

* STRENGTH ON CONCRETE:-

→ The fineness of cement affects the hydration rate. Increasing fineness cause increase rate of hydration hence more strength will achieve.

* RATE OF HEAT EVOLUTION DURING HYDRATION

→ More the finess of cement, high will be heat of hydration.

* TOTAL HEAT OF HYDRATION:-

→ Higher the heat of hydration, more if fineness of cement is more.

less and strenght will be more. 6

1. TEXTURE:

- Smooth surface generates less bond strenght.
- Rougher surface generates a stronger bond between the paste and the aggregate creating a higher strenght.

2. BLEEDING:-

- Bleeding reduce the bond strenght of concrete.
- It is because when water moves towards the surface, it cause poor bond lifts.



Q7 what is effect of following on workability of concrete?

3. POROSITY & ABSORPTION:-

- If the aggregate absorb water and more water is not added as per requirement. workability get decrease. due to dryness of aggregate.

4. AIR ENTRAINING AGENT:-

- Air entrain agent enhance the property of workability of fresh concrete. Fatty acid is used for this purpose.

▷ WORKABILITY OF CONCRETE:-

→ The workability of non-air entrained concrete increase by increasing cement fineness.

Q9 What steps can be taken during transportation & placement of concrete to prevent segregation of concrete?

→ In transportation stage regularly check the performance of mix. Choose the shortest route for transportation of concrete mix

→ Concrete cannot be place from a height more than 1.5m as it will cause segregation. Soon after placing the concrete vibrator should be used.