Claims

1. Cement composition comprising:

100 parts by weight of binder (B) including,

5-30 parts by weight of cement,

0-20 parts by weight of silica fume,

0-50 parts by weight of fly ash, and

42-75 parts by weight of blast furnace slag;

water (W) equivalent to 80-185 kg/m^3 of water content per unit volume of concrete;

~~natural~~ aggregate (A) using only natural aggregate ; and

chemical admixture for concrete (AD).

2. The cement composition according to claim 1, wherein the water (W) is 100-150 kg/m^3 of water content per unit volume of concrete.

3. The cement composition according to claim 1 or 2, wherein a cement content per unit volume of concrete is 18-89 kg/m^3.

4. The cement composition according to any one of claims 1 to ~~3~~, wherein the cement is of 5-20 parts by weight and the fly ash is of 5-50 parts by weight.

5. The cement composition according to any one of claims 1 to ~~4~~, wherein the cement is of 5-15 parts by weight.

6. The cement composition according to any one of claims 1 to ~~5~~, wherein a water-binder ratio (W/B), which is a weight ratio of the water (W) to the binder (B), is greater than or equal to 35% and less than or equal to 45%.

7. The cement composition according to any one of claims 1 to ~~6~~, wherein 28-day standard water curing compressive strength ranges from 16 N/mm^2 to 70 N/mm^2.

8. The cement composition according to any one of claims 1 to 7, wherein the cement composition comprises ~~includes~~ one or more types of additive selected from a group consisting of alkaline component, gypsum, tri-isopropanolamine, and limestone powder.

9. The cement composition according to claim 8, wherein the alkaline component is calcium hydroxide.

10. The cement composition according to claim 9, wherein a weight ratio of the calcium hydroxide to the binder (B) is less than 0.1%.

11. The cement composition according to any one of claims 8 to 10, wherein the gypsum is natural anhydrite.

12. The cement composition according to any one of claims 8 to 11, wherein a weight ratio of the gypsum to the binder (B) is greater than or equal to 1.2% and less than or equal to 6.0%.

13. The cement composition according to any one of claims 8 to 12, wherein a weight ratio of the limestone powder to the binder (B) is greater than or equal to 0.3% and less than or equal to 108.0%.

14. The cement composition according to any one of claims 8 to 13, wherein a weight ratio of the tri-isopropanolamine to the binder (B) is less than 1.0%.

15. The cement composition according to any one of claims 1 to 14, wherein the silica fume is silica fume derived from zirconia.

16. The cement composition according to any one of claims 1 to 15, wherein the fly ash is fly ash that satisfies the values which are specified for type-I fly ash of JIS (Japan Industrial Standard) A6201.

17. The cement composition according to any one of claims 1 to 16, wherein the cement is sulfate resistant portland cement.

18. A method for producing mixed material comprising:
mixing 100 parts by weight of mixed material by mixing
5-30 parts by weight of cement,
0-20 parts by weight of silica fume,
0-50 parts by weight of fly ash, and
42-75 parts by weight of blast furnace slag; and
aggregate (A) using only natural aggregate.

19. A method for producing mixed material comprising:
mixing mixed material by mixing
5-30 parts by weight of cement and
at least one type of material selected from three types of material being 0-20 parts by weight of silica fume, 0-50 parts by weight of fly ash, and 42-75 parts by weight of blast furnace slag; and
aggregate (A) using only natural aggregate.

20. The method for producing mixed material comprising at least one type of material selected from four types of material being 5-30 parts by weight of cement, 0-20 parts by weight of silica fume, 0-50 parts by weight of fly ash, and 42-75 parts by weight of blast furnace slag comprising:
~~mixing mixed material produced by the method for producing mixed material according to claim 18 or 19 and natural aggregate.~~
premixing at least one type of material with natural aggregate when the mixed material comprises the one type of material selected from the four types of materials; and
premixing the material whose amount to be mixed is smaller of two or more types of material with the material whose amount is larger or with the natural aggregate, when the mixed material comprises the two or more types of the material selected from the four types of material.

~~21. A method for producing mixed material including at least one type of material selected from four types of material being 5-30 parts by weight of cement, 0-20 parts by weight of silica fume, 0-50 parts by weight of fly ash, and 42-75 parts by weight of blast furnace slag comprising:~~

~~premixing at least one type of material with natural aggregate when the mixed material includes the one type of material selected from the four types of materials; and~~

~~premixing the material whose amount to be mixed is smaller of two or more types of material with the material whose amount is larger or with the natural aggregate, when the mixed material includes the two or more types of the material selected from the~~

The method for producing mixed material according to any one of claims 18 to 20, wherein the cement is 5-20 parts by weight and the fly ash is 5-50 parts by weight.

~~four types of material.~~

22. The method for producing mixed material according to any one of claims 18 to~~/~~21, wherein the cement is 5-15 ~~5-20~~ parts by weight ~~and the fly ash is 5-50 parts by weight~~.

23. ~~The method for producing mixed material according to any one of claims 18-22, wherein the cement is 5-15 parts by weight.~~

A method for producing mixed material comprising:

mixing at least two types of material selected from four types of material being 5-30 parts by weight of cement, 0-20 parts by weight of silica fume, 0-50 parts by weight of fly ash and 42-75 parts by weight of blast furnace slag.

24. A method for producing mixed material comprising:

mixing at least two types of material selected from three ~~four~~ types of material being 0-20 ~~5-30~~ parts by weight of silica fume ~~cement~~, ~~0-20 parts by weight of silica fume,~~ 0-50 parts by weight of fly ash and 42-75 parts by weight of blast furnace slag.

~~25. A method for producing mixed material comprising:~~

~~mixing at least two types of material selected from three types of material being 0-20 parts by weight of silica fume, 0-50 parts by weight of fly ash and 42-75 parts by weight of blast furnace slag.~~

~~26~~25. The method for producing cement composition comprising:

mixing mixed material produced by the method for producing mixed material according to any one of claims 18 to 22 ~~18-23~~ and water (W).

~~27~~26. The method for producing cement composition according to claim 25 ~~26~~, wherein the water (W) corresponding to 80-185 kg/m^3 of water content per unit volume of concrete is mixed.

~~28~~27. The method for producing cement composition according to

claim 25 or 26 ~~26 or 27~~, wherein the water (W) is 100-150 kg/m^3 of water content per unit volume of concrete.

~~29~~28. The method for producing cement composition according to claim 26 or 27 ~~27 or 28~~, wherein a cement content per unit volume of concrete