Type I Union Ultra 50
Technical Data Sheet

Description:

Philcement Corporation is a multi-purpose cement facility which complies with the requirements of PNS 07:2018 type CEM I Portland cement strength class 42.5 R and 52.5 R.

Union Ultra 50 is recommended as general-purpose cement for use in concretes, mortars, precast, renders, screed and grouts.

Applications:

Union Ultra 50 is suitable for use with a wide range of additives and admixtures to extend the properties and uses of concretes. Ordinary Portland cement is recommended to give improved durability. **Union Ultra 50** may be used in a wide range of mortars. It is manufactured to comply with PNS 07:2018, ASTM C150 / C150M – 18.

Union Ultra 50 is recommended to meet the following requirements:

- To produce high early strength in a wide variety of concretes, mortars and grouts.
- To facilitate the early demolding, handling and use of all types of precast concrete products.
- Reduce formwork striking times.
- To help maintain normal concrete production during cold weather.

Product Packaging:

Union Ultra 50 is available in 40kg bags, tonner bags, sling bags and bulk tankers.

Technical Performance / Quality:

The performance of the cement when tested using PNS 07:2018 test methods will typically be within these ranges:

Parameters	Union Ultra 50	PNS 07:2018
Initial Set Time	2-3 hrs	45 min
Final Set Time	4-5 hrs	375 max
Soundness	0.05	0.80 max
Blaine(m^2/kg)	360 - 390	260 min
3-day C. Strength	25 - 29	12 Mpa
7-day C. Strength	34 - 37	19 Mpa
28-day C. Strength	45 - 50	28 Mpa

Strength:

Optimum performance in terms of strength and durability is achieved in concrete when the water/cement ratio is kept as low as possible, consistent with ensuring satisfactory placing and thorough compaction.

Other factors affecting strength include conditions of curing as well as the individual properties of the constituent materials and their proportions in the mix.

The potential strength of any Portland cement-based product will best develop under conditions where loss of mixing water is minimized during initial hardening. Appropriate curing for optimum performance is essential as well as preventing moisture loss to the surrounding materials. The rate of strength development will depend on ambient conditions and the initial temperature of the mix. As a general rule, concrete should be placed within the range of 10°C to 30°C. In hot weather, freshly poured concrete should be protected against risk of loss of water by evaporation; cracking caused by thermal stresses and reduced ultimate strength.

Type I Union Ultra 50
Technical Data Sheet

Concrete Mix Design:

Concrete mix design needs to be varied to suit individual circumstances. It is strongly recommended that trial mixes are carried out prior to commencement of work to ensure that the mix design and material combinations meet the requirements of the specification and method of use.

Please refer to current standards and recommendations for the manufacture of concretes renders, mortars and screeds.

OPC in mortars:

OPC is suitable for use in a wide variety of mortars for floor screeds, jointing of brick and blockwork and renders for internal and external applications. Performance of mortars will depend on the properties of the sand, mix design and site practice.

Admixtures and additions:

Admixtures such as air entraining agents and workability aids, extenders such as ground granulated blast furnace slag and Fly Ash are compatible with Union Ultra 50. It is recommended that trial mixes are carried out to determine optimum proportion.

Storage:

Union Ultra 50 Cement will keep for up to four to six months if kept in a dry store, off the ground and providing the bags remain sealed.

High temperature and high humidity conditions may reduce the storage life of the product.

Precautions for use:

Union Ultra 50 Cement contains cement powders including crystalline silica which can be harmful to the skin.

During use, avoid inhalation of dust and contact with the skin and eyes. Wear suitable clothing, gloves, eye protection and respiratory protective equipment.

If contact with the skin occurs, thoroughly clean the area with plenty of fresh water and soap. In case of contact with the eyes rinse with plenty of fresh water and seek medical advice.

If swallowed, seek medical attention immediately. Do not induce vomiting.

For further information consult the Material Safety Data Sheet and read the product label carefully before use.

Major Mineral Constituents in Portland Cement

Compound	Abbreviation	Chemical Formula	Typical Concentration %
Tricalcium Silicate	C3S	3CaO*SiO2	55 – 65
Dicalcium Silicate	C2S	2CaO*SiO2	10 – 20
Tricalcium Aluminate	C3A	3CaO*Al2O3	5 – 10
Tetracalcium Alumino-ferrite	C4AF	4CaO*Al2O3*Fe2O3	8 - 12

Technical Support:

For further advice please contact Technical Support at: