

UNF-5

Superplasticizer ASTM C 494, Type F; ASTM C 1017

Sodium Naphthalene Sulfonate Formaldehyde($\text{Na}_2\text{SO}_4 \leq 18\%$)



Uses

- ◆ UNF-5 produces concrete with extremely workable characteristics referred to as high slump.
- ◆ UNF-5 also allows concrete to be produced with very low water/cement ratios at low or normal slumps.
- ◆ UNF-5 is ideal for use in prestress, precast, bridge deck or any concrete where it is desired to keep the water/cement ratio to a minimum and still achieve the degree of workability necessary to provide easy placement and consolidation.
- ◆ UNF-5 will also fluidize concrete, making it ideal for tremie concreting or other applications where high slumps are desired.
- ◆ UNF-5 is compatible with Portland Cement, Normal Portland cement, Portland Slag Cement, Fly-ash Cement, Portland Pozzolanic Cement, etc.

Description

UNF-5 is a high range water reducer, commonly referred to as a superplasticizer, also named Naphthalene Sulfonate Formaldehyde Condensate (NSF), SNF, PNS, etc..

UNF-5 is made of naphthalene, sulfuric acid, formaldehyde and alkali, through sulphuration, hydrolyzation, condensation and neutralization reaction. UNF-5 contains no chloride. Thus, it meets the requirements of chemical admixture specifications for concrete: ASTM C 494, Type F; ASTM C 1017, GB8076-1997 and GB50119-2003.

Advantages

- ◆ UNF-5 produces high slump flowable concrete with no loss in strength.
- ◆ UNF-5 produces low water/cement ratio concrete and therefore, high strengths.
- ◆ UNF-5, in prestress/precast work, can be used to substantially reduce or eliminate the high energy requirements of external heat for accelerated curing.
- ◆ UNF-5 concrete, even at high slump, exhibits no significant segregation in comparison to concrete without a super-plasticizer at the same slump.
- ◆ UNF-5 aids in rapid discharge of concrete from truck mixers thereby reducing on the job time and improving mixer utilization.

Properties, Features & Characteristics

1. Visual Appearance: Light brown powder. Non-poisonous, odorless, non-flammable and non-corrosive to steel bars.
2. Remarkable Plasticity: As a condition of blending where amount of cement and collapsibility are fixed beforehand, mixing water can be decreased by 10-30% when it is mixed with reinforced concrete at 0.3-1.5%.
3. Improve miscibility of concrete amalgamator with water and collapsibility as well. As a condition of equivalent blending, collapsibility can be increased.

Specifications

Items	Criteria	Actual Results
Solid Content, %	92 min	93.41
Moisture, %	8.0 max	7.1
Fineness (0.315mm remains), %	15.0 max	9
pH value	7 - 9	7.8
Sodium Sulfate Content, %	18.0 max	16.71
Chloride Content, %	1.0 max	0.21
Surface Tension	68-72 Mn/m	70
Cement Paste Flow	230mm min	240mm
Water Reducing Rate	18% min	20%
Steel-bar Corrosion	None	None

Test Data Sheet

Items	Addition Rate (C×%)	Water (g)	Slump (mm)	Water Reducing Rate (%)	Compressive Strength (MPa) / Compressive Strength Ratio (%)			
					1 day	3 day	7 day	28 day
Reference Concrete	0	2615	80	0	3.16/100	12.89/100	18.62/100	22.72/100
UNF-5	0.75	2090	74	20.1	6.86/217.1	22.52/174.7	29.10/156.3	35.92/158.1

Addition rates

UNF-5 can be added directly or added in after melt. It can be added during mixing and after mixing. The afterward approach can achieve better result. The suggested addition rate is 0.75%.

Instruction

Prepare solutions as required.

Direct use of powdery agent is allowed. Alternatively the addition of the agent is followed by water moisturization (water-cement ratio:60%).

The agent can be combined with other externally applied agents if pilot development or laboratory test is satisfied.

Package, storage & handling

- ◆ For powder: Woven fabric bag with plastic liner. Net weight: 25kg +/- 0.13 kg.
- ◆ Cautions should be taken to prevent packages from being torn by sharp-ended objects while being transferred or delivered. When being contaminated by high humidity or moisture in case of leakage, it can be prepared in prescribed ways for further use without surrendering any effect.
- ◆ It should be stored in a dedicated warehouse that is well-ventilated and dry. It remains effective in one year. After the expiration date, it can be used again if testing results fall within the established range.