POLY CARBOXYL ETHER (PCE) PROJECT OF 18,000 T/Y

At present we are manufacturing and supplying Sulphonated Naphthalene Formaldehyde (SNF) which is mostly used in Construction Chemical Industry to manufacture water reducing Admixtures also known as super plasticizers. In India now due to recent developments in construction technology high strength concrete started coming in to play. SNF was workable till the concrete of M45 grade. But the concrete which is more than M45 grade requires different type of admixtures known as hyper plasticizers. To formulate hyper plasticizer the basic raw material required is Poly Carboxylate Ether (PCE).

ADVANTAGES OF PCE:

a. Produces concrete with high levels of workability without segregation.
b. Provides significantly higher strengths and normal setting time.
c. High early strength and 28 day’s strength increase obviously, especially for high dosage fly ash concrete.
d. Has excellent concrete rheology and handling properties.
e. Provides improved finish ability and surface finishes.
f. Has superior air entrainment control.
g. Provides standard water reduction at normal addition rates and significant water reduction at higher addition rates.
h. Has no chloride ions and non-corrosion to steel bar.
i. Improves the frost resistance and carbonation resistance of the concrete. Lower drying shrinkage of the concrete by 20% or more compared to Naphthalene-based admixture.

To summarize, Poly carboxylates are sophisticated high end super plasticizers component for concrete application, are considered superior to any other super plasticizers component.

As a part of growth/diversification strategy, various projects were studied based on MCF’s core competency and available infrastructure. However it is identified that there is an excellent growth potential for Poly Carboxylate Ether (PCE) also known as next generation water reducer which is next to Sulphonated Naphthalene Formaldehyde (SNF).
POLY CARBOXYLATES PRODUCTION PROCESS

PROCESS OVERVIEW

Manufacture of Poly carboxylates is essentially a batch operation and comprises of two main steps, i.e.

a) Esterification
b) Polymerization

The basic raw materials for Poly carboxylate production are Methoxy Poly Ethylene Glycol (MPEG / PEGM 2000) and Meth acrylic Acid. The overall chemical reactions involved in the above mentioned (a) & (b) process steps are schematically shown in Figure 1A and 1B below.

![Figure 1A: Esterification Reactions](image)

![Figure 1B: Copolymerization and Neutralization Reactions](image)
No liquid effluent and solid waste generation is envisaged.

**ENVIRONMENTAL MANAGEMENT**

This plant is predominantly solid handling plant and escape of solid particles into atmosphere is not envisaged. Periodically the dust level in the plant stack will be monitored. The particulate Matter would be less than 150 mg/Nm³.

There will be no liquid effluent generated in the plant. Liquid packaging system will be adopted within built anti drip/zero spillage mechanism. The spillages if any from the plant floor will be collected in and recycled back to soil conditioners section.

There is no solid waste from the plant. The spillages if any from various points in the plant are effectively collected and recycled back to the system.

**Sewage Treatment Plant:**

The domestic effluent generated due to new PCE complex shall be collected and treated at existing sewage treatment plant (STP). The details of the existing STP is given below:
MCF has put up a centralized sewage treatment unit. The combined sewage from the factory is collected in the sump tanks and pumped to the bar screen chamber and oil trap to remove floating solids and oil traces respectively. After this preliminary treatment the effluent is fed to equalization tank.

Effluent from the equalization tank is fed to the Membrane Bio-Reactor (MBR) tank at constant flow rate. The high amount of bacteria give better and complete removal of organic matter from the raw effluent in relatively small area. Aeration is done both to the equalization and MBR tanks through diffuser membranes by using blowers.

The suction pumps directly sucks permeate and the filtration is carried out by the membrane. The suspended solids, turbidity, bacteria and viruses in permeate water are removed to the levels required for reusing treated water. The treated water is reused in cooling tower as makeup.

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