

IS 3903:1984 DIMETHOATE EMULSIFIABLE CONCENTRATE

Dimethoate is a contact and systemic organophosphate insecticide effective against a broad range of insects and mites when applied on a wide range of crops. It is used against a wide range of insects, including aphids, thrips, planthoppers and whiteflies on ornamental plants, alfalfa, apples, corn, cotton, grapefruit, grapes, lemons, melons, oranges, pears, pecans, safflower, sorghum, soybeans, tangerines, tobacco, tomatoes, watermelons, wheat and other vegetables. It is also used as a residual wall spray in farm buildings for house flies. Dimethoate is administered to livestock for control of botflies. It works by inhibiting cholinesterases, which are enzymes involved in nerve impulse transmission.

The molecular formula is $C_5H_{12}NO_3PS_2$. It is in the form of a stable homogeneous liquid, free from visible suspended matter and sediment, to be applied as an emulsion after dilution in water.

These agricultural chemical products undergo chemical and physical changes on storage. The rate at which these changes occur depends on the nature of the active constituent(s), the formulation type, the packaging and, notably, the storage conditions (temperature, light and humidity).

In view of this, The Indian Standard specification IS 3903:1984 covers all the quality parameters to ensure that the product remains fit for use as long as there are no adverse effects on application, biological performance, and the safety of operators, consumers and the environment.

The biological efficacy of **Dimethoate** (active ingredient) gradually decreases with time as they may change chemically and break down into products that may no longer have insecticidal properties, thus decreasing the concentration of the original active ingredient. Hence there is a parameter named dimethoate content in the Indian Standard. There may be a change in pH on storage which may result in instability of the active substance. Also Dimethoate is fairly stable in water and acid solution, at room temperature, and unstable in alkaline solution. Hence the limits for acidity level are specified.

Liquid formulations may be adversely affected by storage at low temperature. As storage at low temperature may result in crystallization of active constituent(s) or there can be significant changes in viscosity or phase separation of emulsions leading to product not remaining homogenous or uniform during application. Hence cold test is available in the Indian Standard to address these issues.

As the dimethoate contain petroleum distillates as part of their inert ingredient it becomes necessary to know whether the product is combustible, flammable or extremely inflammable as this knowledge is helpful in providing safeguards against fire hazards during their storage, transportation, handling and use. Hence ISS addresses the parameter named Flash point.