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"Dutch Boy"®

BENTONE® 38

New Gelling Agent for Organic Liquids



DUTCH BOY CHEMICALS

A Product Development of
NATIONAL LEAD COMPANY

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"Dutch Boy"®

BENTONE® 38

"DUTCH BOY" BENTONE 38 is a new gelling agent for organic liquids. It has two outstanding features:

1. High gelling efficiency in a wide range of organic liquids of low and intermediate polarity.
2. Very light color both in the dry and in the gelled states.

BENTONE 38 is an organic compound of a special montmorillonite* and is supplied as a fine, creamy-white powder. Like its companion gelling agents—BENTONE 34 and BENTONE 18-C—the organic portion is linked to the montmorillonite through a stable chemical bond.

BENTONE 38 gels are of the short, thixotropic type. It produces predictable bodying or viscosity increases which are remarkably stable and unaffected by changes in temperature. The gel structure of BENTONE 38 promotes particle suspension and penetration control. In addition, BENTONE 38 exerts a strong reinforcing action in non-volatile organic compositions.

Fields of Application

The high gelling efficiency and light color of BENTONE 38 suggest its use in many types of organic systems, such as the following products:

Paints	Waxes
Enamels	Adhesives
Varnishes	Mastic Compounds
Vinyl Dispersions	Cosmetics
Epoxy and Polyester Resins	Non-Systemic Pharmaceutical Preparations

Table of Properties

Composition	Organic derivative of a special magnesium montmorillonite
Color	Creamy-white
Form	Finely divided powder
Specific Gravity	1.50
Bulking Value	13.0 lbs./gal.
Fineness	Less than 2% retained on No. 200 sieve**

General Application

BENTONE 38, in general, has fields of application and incorporation techniques similar to BENTONE 34. BENTONE 38 will thicken and gel straight non-polar solvents, such as benzene, toluene, mineral spirits and gasoline. It will also gel liquids of intermediate polarity, such as chlorinated solvents, vegetable oils, plasticizers and resins. However, BENTONE 38 has two distinct and important advantages.

* Montmorillonite is a bodyous silicate mineral having an expanding lattice.

** When properly dispersed BENTONE 38 exhibits bubbles [illegible] with an ultimate particle size of [illegible] microns in continuous dimension, and approximately [illegible] microns in minimum dimension.

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3. *Gelling Efficiency* — Point evaluations show that when BENTONE 38 is used in place of BENTONE 34, approximately 30% less BENTONE 38 is required to achieve a given point consistency. This greater efficiency is especially useful in varnishes and enamels, where the mild flatting action of BENTONE 34 sometimes limits its use in gloss finishes. BENTONE 38, by achieving a given viscosity at lower levels, may be used in most practical concentrations in gloss finishes without undesirable flatting action.

4. *Lighter Color* — BENTONE 38 gels are the lightest in color of any of the BENTONE gels. In addition, the reduced amount of BENTONE 38 required to produce a specific bodying increase or particle suspending action means that less of the existing color of the gelled BENTONE 38 is added to the organic system. This property proves most advantageous in such compounds as white or light colored paints, clear varnishes, waxes, cosmetics, or vinyl dispersion systems in white or pastel shades.

Proper Incorporation Methods

Equipment Required — BENTONE 38 must be incorporated into organic liquids using high shear dispersion equipment, in order to attain maximum efficiency of gelation. Ball or pebble mill or rolled mill grinds will produce excellent BENTONE 38 gels. In paint practice, BENTONE 38 is usually incorporated into the vehicle with the pigments during the regular grinding operation.

Use of Polar Additives — Small amounts of polar solvent, such as methanol, ethanol or acetone, are especially useful as additives in developing the maximum gelling efficiency of BENTONE 38. Their suitability depends on the amount of polarity which exists in the organic system to be gelled. If, for example, a major constituent is odorless mineral spirits (low polarity), a polar additive is recommended. If the compound is high in aromatic content, polar additives may not be required. Polar additives act as an aid in attaining maximum gel efficiency, and frequently shorten the grinding cycle required. They are not a substitute for effective incorporation equipment.

The amount of polar additive to be used is based on the weight of BENTONE 38. Depending on the particular system involved, polar additives are beneficial in the range of 20% to 50% of the BENTONE weight. The polar solvent is normally used to pre-disperse the BENTONE 38 prior to incorporation into the organic liquid. Another common method is to add the polar solvent to the organic liquid prior to the grinding step.

Effect of Heat on Incorporation — BENTONE 38 gels can normally be produced without the application of heat. In some instances, it has been found that heating to 100-125°F. facilitates the gelation by reducing the amount of mechanical work or polar solvent required.

Incorporation with High Shear Stirring — In some cases, particularly in solvents with high aromatic content, good BENTONE 38 gels may be produced with high speed stirring equipment, with the addition of polar solvents. Usually the BENTONE 38 is first dispersed in the non-polar liquid, and the polar additive introduced afterward, with constant agitation. In cases of this type, the gels formed should be compared with gels made in the same system using high shear grinding methods. This will insure that the BENTONE 38 has been gelled at or near peak efficiency by the high speed stirring procedure.

General Recommendations

The amount of BENTONE 38 required depends upon the type of organic system and the degree of thickening or other properties desired. With maximum gelation, approximately 5% BENTONE 38 thinned on the resin contents may suffice in a vinyl plastisol. From 2 to 3 pounds of BENTONE 38 per 100 gallons would be recommended for a gloss enamel, while a stipple paint, for example, may need between 6 and 8 pounds per 100 gallons of paint.

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