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"Dutch Boy"

L-26

Versatile Lead Salt
of
2-Ethylhexoic Acid



A
Product Development
of
NATIONAL LEAD COMPANY

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NLI 114301

"Dutch Boy"

L-26

L-26, the normal lead salt of 2-ethylhexoic acid, is a pale straw colored, mild odored, viscous liquid containing approximately 41 per cent lead. Insoluble in waters and alcohols, it is readily miscible with a wide variety of common organic solvents and plasticizers, forming stable solutions.

Because of its unique combinations of properties, L-26 may be used to advantage as a ~~drier for paints and varnishes~~, as a hardening or vulcanizing agent for various types of synthetic resins, as a component of waterproofing compounds and lubricants, and for a variety of other uses.

Table of Properties

Composition	Lead 2-Ethyl Hexoate
Formula	$\text{Pb}[\text{CH}_3(\text{CH}_2)_3\text{CH}(\text{C}_2\text{H}_5)\text{COO}]_2$
Molecular Weight	493.38
Specific Gravity	1.52 at 25°C
Weight per Gallon in Pounds	12.6
Viscosity (Gardner-Holdt)	Z8 to Z10 (25°C)
Color (Gardner 1933 std.)	1—
Lead Content (% Pb)	40 to 41.5%
Solubility	Soluble in the petroleum hydrocarbons, ethyl ether, dibutyl phthalate, carbon tetrachloride, benzene, xylene, ethyl acetate, methyl ethyl ketone and many other organic solvents. Insoluble in methanol, ethanol, ethylene glycol and water.

Uses

Its unique property of being liquid at room temperature, its high lead content and its wide range of solubility in many readily available organic solvents indicate that L-26 has many potential uses including the following:

~~*Paint Drier*—L-26 is an excellent drier for paints. It compares very favorably with the best of the lead driers in speed of drying and in the color stability in the dried paint film. Liquid driers containing L-26 have excellent package stability remaining free from sediment indefinitely.~~

~~Because of its high lead content L-26 is comparable in cost with the best driers and in addition it has the distinct advantage of light color and unobjectionable odor.~~

~~Driers containing L-26 together with appropriate quantities of manganese and cobalt driers, successfully pass the Federal Specification on Curdling in raw linseed oil.~~

Hardener for Silicone Paint Films—It has been found that silicone resins can be made to dry to a glossy adherent film on sheet metal when a soluble organic lead salt is added to a mineral spirits solution of the silicone resin to the extent of about 0.4% Pb content based on the resin, and the coated surface is exposed to infra red radiation for 15 minutes at 25°C.* The finish is improved by continued exposure to infra red heat at 250°C for an additional eighteen hours. A simulated automobile finish of 75% resin, 17% solvent naphtha, 0.4% lead equivalent soluble organic lead salt and 8% of maroon toner gave a finish which could not be marred by the thumbnail, a gloss of 82 at 60° and a finish which was as close an approach to a ceramic finish as any paint film thus far achieved.

Our own Research Laboratory tests with L-26 confirm the findings of the National Paint Varnish & Lacquer Association. L-26, which does not vaporize at 300°C and which decomposes before boiling, gives excellent color and color retention in baked finishes. The same formulations dried tack-free in 16 hours without application of heat.

Both baked and air-dried films exhibited excellent adhesion, flexibility, hardness, good dielectric properties and impermeability to moisture.

The process of drying the film is not an oxidation reaction and since gelling of the silicone is progressive after 3 to 6 days at room temperature L-26 must be added to the resin directly before use.

Hardener for Silicone Insulating Varnishes—With silicone resins used for the coating of electrical equipment such as motor coils, etc., the time of curing can be cut down, without impairing the physical and electrical characteristics of the coatings, by using a combination treatment consisting of the incorporation of 0.8% Pb content as L-26 in the resin, a short treatment with infra-red radiation followed by another short treatment with ultra-violet light. This treatment gets rid of solvent after which the ultra-violet treatment catalyzes the polymerization and hardening of the resin to a tough adherent film.

The reaction in the case of both the silicone paint and insulating varnish is catalytic and the drying is not an oxidation as it takes place even in the absence of air. As explained under the heading of "Hardener for Silicone Paint Films," L-26 must be added to the insulating resin just prior to application.

Asphalt Base Solvent Removable Rust Preventative Coatings—L-26 is an excellent ingredient to improve the impermeability to water, flexibility and film adhesion to metal parts of asphalt-base temporary coatings. Additions of L-26

* National Paint Varnish and Lacquer Association—Scientific Section Circ. 705.

equivalent to 2.50% of the weight of the finished paint give excellent protective coatings.

Protective coatings of this type can be easily removed with mineral spirits or other common solvents such as benzene. In this manner metal surfaces which cannot be painted with permanent coatings may be protected until such time as the metal equipment goes into service.

Vulcanizing Agent for Liquid Organic Polysulphide Polymers—L-26 serves as a curing agent for the impregnation of leather with liquid organic polysulphide resins. The leather is treated with a 10% solution of L-26 in benzene. The solvent is driven off and the treated leather is saturated with the liquid organic polysulphide resin and heat is applied to vulcanize the resin. The resulting product combines the oil resistant, solvent resistant, and gas impervious characteristics of the polysulphide vulcanizate with the strength and other desirable properties of leather.

This application suggests the possibility of modification to include the impregnation of paper, fiber glass, asbestos, cotton and other fibrous material with the liquid organic polysulphide polymers.

Potential Uses—All of the uses noted have been dependent upon the fact that the L-26 is soluble in common solvents and is stable at relatively high temperatures. This would suggest its potential use as a reinforcing agent for lubricating oil and greases, as a hardening agent for alkyd resins, etc.

A recently suggested use of L-26 in connection with silicone paint films is in the pretreatment of white metal and bronze bearings. It is predicted that bearings coated with the silicone paints resist corrosion in storage and make it possible to use machines, such as automobiles, the bearings of which have been thus coated, without the necessity for the customary "breaking in" period at low speeds.

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