

PAU TAI INDUSTRIAL (THAILAND)

COMPANY LIMITED

Company Description:

PAU TAI INDUSTRIAL (THAILAND) COMPANY LTD was established on May 2004. We received approval from Board of Investment in Thailand and acquired the assets of OMG (Thailand) Company Limited in November 2004 with the intention of expanding our Company. After manufacturing site had been renovated and upgraded, PAU TAI INDUSTRIAL (THAILAND) COMPANY LTD has started the production of PVC Stabilizers in January 2005. We increased the range of our products by introducing Paint Driers, polyester Promoters, Catalyst in the following year.

Today, PAU TAI INDUSTRIAL (THAILAND) COMPANY LTD provide its versatility by expanding the range of its products which are the broad spectrum of liquid Ba/Cd/Zn, Ba/Zn and Ca/Zn PVC Stabilizers, Paint Driers, Polyester Promoters, Wood Preservatives/Fungicides, Catalyst as well as Lubricant additives in order to satisfy variety of consumer and business. We are committed to provide the technical innovation by delivering better, safer, wider product portfolios in order to continually achieve our customer satisfaction with high quality products and excellent services. Our plant has the capacity to manufacture about 3600 tons per annum of the above products with the flexibility to manufacture customized grades tailored to customer specifications. Our products are well accepted by all Multinational and Local manufacturers of Paint, Varnishes, Polyester Resins in Thailand. We are regularly exports our UNINOX grade Paint Driers, Polyester Promoters, PVC Stabilizers to South East Asia and Middle East.

COMMITMENT TO “QUALITY”

Our Quality Control Laboratory is well equipped with modern instruments and well trained technical personnel to deliver the “BEST QUALITY” to our valued customer for long term business relationships. Following properties will be tested for each lot delivered to our customers as a commitment for better service with competitive price based on our **Innovative Technology on Metal Carboxylates.**

- % Metal
- Color
- Non Volatile Matter (% Solids)
- Acid Value
- % Moisture
- Viscosity
- Density
- Flash point

Our R&D Department strives continuously to further improve the products “Quality” by applying in our Innovative Technology on Metal Carboxylates.

A Short Description about UNINOX Grade Paint Driers....

UNINOX driers are the drying catalysts or commonly known as Paint driers or metallic driers. They are the range of metallic driers formulated to achieve optimum performance for the Paint, Varnishes, Printing Ink and unsaturated Polyester Resins Industries.

UNINOX driers are used to enhance the film formation and curing paint, Printing Ink, Varnish and Polyester Resin Industries. They are the Oil Soluble Soaps and Salts of the metals under period 4 & 6 of Periodic table. Most effective metals used as driers are Lead, Cobalt, Manganese, Zinc, Zirconium, Cerium, Barium, Calcium, Iron, Copper etc. The soaps are synthesized by reacting suitable metal salts with mono-carboxylic acids. Like (a) Naphthenic acid (Natural fatty acids) and (b) Neodecanoic acid/Versatic acid (c) Octoic acid etc. The uses of synthetic mono carboxylic acid like 2-ethyl hexanoic acid has gained wide acceptance in drier technology due to the major advantages like (1) Constant Chemical Composition and structure (2) high purity and batch to batch consistency (3) Good colour retention (4) No pungent odour (5) They yield metal soaps of constant composition, high purity and good solubility.

UNINOX grade driers are based on 2 Ethyl hexanoic acid. They are formulated to impart high metal contents and low viscosity. Neodecanoate/Versates and Naphthenate based Paint Driers are also available.

UNINOX driers are offered as highly balanced liquid systems characterized by

- (1) Purity of highest order.
- (2) Good Stability and Solubility in various vehicles.
- (3) Retention of clarity over long periods of time.
- (4) Low Viscosity for easier handling.
- (5) Certified metal content.
- (6) High metal content with no tendency to crystallize or sludge out.
- (7) Resistance to atmospheric and climatic conditions.
- (8) Resistance to colloidal shock.
- (9) Less tendency to be absorbed.
- (10) Odourless.

Cobalt Octoate is the most active surface drier. Cobalt effects rapid surface drying and is generally used in conjunction with auxiliary driers. It is usually added at 0.05 to 0.4 % based on vehicle solids. It is a strong oxidant. It is compatible with all surfaces coating media. Atmospheric humidity does not affect Cobalt drier. This unique feature prevents water vapor present in atmosphere from penetrating the paint film.

Cobalt Octoate being the most effective drier promotes polymerization of media, hardens the paint film, improves gloss and water resistance and reduces brittleness of film. The careful use of **Cobalt octoate** gives the paint film a good gloss, free from frosting tendency. This drier is a universal drier, which is essential in all the media and is capable of performing individually giving reasonable properties to the paint film.

In air-drying type insulating varnishes use of **Cobalt Octoate** increases water resistance, but the excessive use of **Cobalt octoate** causes brittleness and early failure of insulation.

Cobalt Octoate accelerates the catalytic action of Methyl Ethyl Ketoxime (MEKO) to polymerize unsaturated polyester resin. The typical characteristics of certain concentrations of **UNINOX grade Cobalt Octoate** are as under:

Product Name	Cobalt, % (w/w)	Colour	Physical State	Density at 30 °C, gm/ml	Non volatile matter, % w/w	Viscosity at 30°C, cSt
UNINOX Co 12	12 ± 0.2	Blue	Liquid	1.02 ± 0.04	65 ± 5	200 max
UNINOX Co 10	10 ± 0.2	Blue	Liquid	0.98 ± 0.04	55 ± 5	100 max
UNINOX Co 08	8 ± 0.2	Blue	Liquid	0.90 ± 0.04	41 ± 5	50 max
UNINOX Co 06	6 ± 0.2	Blue	Liquid	0.88 ± 0.04	32 ± 5	50 max

Manganese Octoate is a very stable auxiliary drier. It is an active drier metal and strong oxidant, promotes polymerization to a greater degree than cobalt. It is often used alone in backing finishes and in combination with Lead and Cobalt in air-dry applications.

Manganese Octoate is mainly used in exterior paints, floor finishes, backing enamels and in the paints where colour is not a constraint. The dosage of Cobalt octoate can be minimized by using **Manganese Octoate** as it is capable of replacing Cobalt because of its high activity.

Manganese Octoate prevents paint film from the wrinkling effect. **Manganese Octoate** is not recommended in white finishes as it gives a typical tinting effect of its own colour. The typical characteristics of certain concentrations of our **UNINOX grade Manganese Octoate** are as under:

Product Name	Metal Content % (w/W)	Colour	Physical State	Density at 30 °C, gm/ml	Non volatile matter, % w/w	Viscosity at 30°C, cSt
UNINOX Mn 10	10± 0.2	Dark brown	Liquid	0.98±0.05	55 ± 7	300 max
UNINOX Mn 06	6 ±0.2	Dark brown	Liquid	0.90 ±0.05	30± 7	100 max

Zirconium Octoate is a very efficient auxiliary drier. It is use in paint media with Cobalt and other auxiliary driers to boost up the performance of paints and varnishes. **Zirconium Octoate** is the best replacement of Lead octoate when used in combination with Cerium or Calcium octoate in the lead free paint systems.

Zirconium Octoate shows goods gloss retention, colour, and colour retention compared to Lead, but does not perform as well under adverse drying conditions of low temperature and high humidity. **Zirconium Octoate** is the most useful drier for water resistant finishes due to its stabilizing effect on the ester linkages in the media.

As a strong cross-linking agent, Zirconium improves the hardness and gives better adhesion. Because of its abrasion resistant characteristics it is used in wire enamels. In alkyd amino combinations, **Zirconium Octoate** has been proved to be the best auxiliary drier, which resists absorption and improves the performance of other driers used in combination with it. It has a good effect in epoxy esters too. But in the phenolic resin media, Zirconium has not shown any significant effect. **Zirconium Octoate** is widely used in white paints in combination with Cobalt and Cerium Octoate as it reduces the yellowing tendency of the white film and retains the whiteness by protecting the film from any weather effects. Lead octoate is not recommended in the white paint when **Zirconium Octoate** is used as an auxiliary drier. The typical characteristics of certain concentrations of our **UNINOX grade Zirconium Octoate** are as under:

Product Name	Metal Content % (w/w)	Colour (Gardner)	Physical State	Density at 30 °C, gm/ml	Non volatile matter, % w/w	Viscosity at 30°C, cSt
UNINOX Zr 24	24 ±0.3	6 max	Liquid	1.28 ±0.04	80± 5	300 max
UNINOX Zr 18	18± 0.3	6 max	Liquid	1.11 ±0.04	63 ± 5	100 max
UNINOX Zr 12	12 ±0.2	6 max	Liquid	0.96± 0.04	40 ± 5	100 max

Lead Octoate

Lead is one of the auxiliary driers also called as through drier. **Lead Octoate** is used as active or top drier. It promotes hard, through drying throughout the entire film and also promotes flexibility. In alkyd finishes where fume proof finishes are not specified. Lead is used in combination with Cobalt and Calcium Octoate. It is always advisable to use **Lead Octoate** after the addition of Calcium

Octoate to eliminate the possibility of reaction of lead with unreacted phthalic anhydride in alkyd media, which could form lead phthalate.

In long oil alkyd medium 0.05 to 2.00% of lead is the usual amount required in conjunction with Cobalt and Calcium soaps. In outside paints and floor finishes as well as in banking enamels **Lead Octoate** is used with Manganese drier to produce a tough and hard film. In long oil phenolic resin, lead promotes drying. It is also used in Polyurethane finishes as major auxiliary drier. **Lead Octoate** is the most important auxiliary drier especially in applications where drying is required at low temperatures (less than 10 deg. centigrade.)

Different metal concentrations of lead drier such as 24,30,32,36 percentage are used by the paint industry. The typical characteristics of certain concentrations of **our UNINOX grade Lead Octoate** are as under:

Product Name	Metal Content % (w/w)	Colour (Gardner)	Physical State	Density at 30 °C, gm/ml	Non volatile matter, % w/w	Viscosity at 30°C, cSt
UNINOX Pb 36	36 ±0.50	6 max	Liquid	1.35 ±0.05	72± 5	200 max
UNINOX Pb 32	32 ±0.50	6 max	Liquid	1.25 ±0.05	65 ± 5	200 max
UNINOX Pb 30	30 ±0.50	6 max	Liquid	1.22 ±0.05	62± 5	100 max
UNINOX Pb 24	24 ±0.50	6 max	Liquid	1.10 ±0.05	45± 5	100 max

Calcium Octoate is an important auxiliary drier. It is used in combination with Lead and Cobalt octoate, mainly in alkyd finishes.

Calcium Octoate prevents the formation of lead haze in clear medium. Alkyd resin paints and varnishes containing Lead drier may become cloudy during the storage due to precipitation of insoluble Lead phthalate. This defect can be markedly reduced or eliminated by including a fairly substantial proportion of **Calcium Octoate** in the drier mixture.

Calcium used in conjunction with Cobalt increases the efficiency of Cobalt drier in the paint medium. **Calcium Octoate** is an important auxiliary drier which eliminates hazing, blooming, clouding of the finishes and keeps them clean and shiny.

Calcium Octoate suppresses the gas checking effect and wrinkling effect in the alkyd finishes where Cobalt and Lead driers are used in combination with Manganese Octoate. The typical characteristics of certain concentrations of **our UNINOX grade Calcium Octoate** are as under:

Product Name	Metal Content % (w/w)	Colour (Gardner)	Physical State	Density at 30 °C, gm/ml	Non volatile matter, % w/w	Viscosity at 30°C, cSt
UNINOX Ca 10	10± 0.2	8 max	Liquid	0.99 ±0.05	46 ± 5	100 max
UNINOX Ca 06	6 ± 0.2	6 max	Liquid	0.90 ±0.04	41 ± 5	80 max
UNINOX Ca 05	5 ± 0.2	6 max	Liquid	0.89 ±0.04	41 ± 5	80 max

Zinc Octoate is an auxiliary drier used as a pigments dispersing agent. The pigment such as titanium dioxide and carbon black have the tendency to absorb driers which reduces loss or effect of drying rate.

The absorption of driers in pigments can be reduced by grinding the pigments with **Zinc Octoate** to retain the drying capacity of the paint media. The preparation of paints based on high viscosity media which may have only limited solubility in the solvent employed, **Zinc Octoate** should be used before the addition of pigment as well as other drier combinations.

Zinc Octoate prevents the paint film from webbing and frosting effects. The use of **Zinc Octoate** is not suggested with dehydrated castor oil media and long oil media because these driers may produce bloom and reduce gloss of the film. The typical characteristics of certain concentrations of **our UNINOX grade Zinc Octoate** are as under:

Product Name	Metal Content % (w/w)	Colour (Gardner)	Physical State	Density at 30 °C, gm/ml	Non volatile matter, % w/w	Viscosity at 30°C, cSt
UNINOX Zn 12	12 ± 0.2	6 max	Liquid	0.95 ± 0.05	50 ± 5	100 max
UNINOX Zn 10	10 ± 0.2	6 max	Liquid	0.90 ± 0.05	42± 5	50 max

POLYESTER PROMOTERS

Water white color **UNINOX K 15** widely used as polyester promoters.

FUNGICIDES/WOOD PRESERVATIVES

UNINOX Cu 10 N and **UNINOX Zn 08 N** widely used as fungicides and wood preservatives.

Waterborne UNINOX Grade Paint Driers:

Due to strong environmental legislation to reduce Volatile Organic Content (VOC) in Paint, excellent water reducible resins with very low VOC content are now being used by Paint manufacturers. Today Pau Tai based on their Innovative Technology on Metal Carboxylate developed UNINOX grade driers specifically designed for the curing of waterborne Paints and Coatings.

UNINOX Co 06WD is a water dispersible metal carboxylate containing 6% cobalt metal. UNINOX Co 06WD is developed to catalyze the oxidative cure for waterborne resins and hence acts as "Surface" drier for waterborne resins. Recommended starting point concentration is 0.10-0.15% metal/binder.

UNINOX Mn 06WD is a water dispersible metal carboxylate containing 6% manganese metal. UNINOX Mn 06WD is developed to catalyze the oxidative cure for waterborne resins and hence acts as "Surface" drier for waterborne resins. Recommended starting point concentration is 0.10-0.15% metal/binder.

UNINOX Ca 06WD is a water dispersible metal carboxylate containing 6% of calcium metal. It acts as an auxiliary drier for water-reducible alkyd coatings and is responsible for crosslinking these polymers. It also functions as an economical pigment-wetting agent and loss-of-dry inhibitor. Recommended starting point concentration is 0.2% metal/binder.

UNINOX Zr 12WD is a water diluteable metal carboxylate containing 12% of zirconium metal. UNINOX Zr 12 WD is an auxiliary drier for water-diluteable alkyd coatings and is responsible for crosslinking these polymers. Recommended starting point concentration is 0.3% metal/binder.

PAU TAI COMBINATION DRIERS:

PAU TAI offers a wide range of Combination Driers based on our Innovative Technology on Metal Carboxylate and extensive experience while working with Formulators of our reputed customers (MNC and Local). We can tailor make any combination as per customers specification and requirements.

PAU TAI NEW PRODUCT:

Today Pau Tai developed the following Lubricant Additives for Lubricant Oils and Greases.

1. UNINOX Pb 30 LUBE-----EP additives.
2. UNINOX Zn 14.5LUBE-----Antiwear Agent and Rust Inhibitor
3. UNINOX Zn 10 LUBE ----- Antiwear Agent and Rust Inhibitor
4. UNINOX Zn 22-----Antiwear Agent and Rust Inhibitor

PVC STABILIZERS

LIQUID Ba/Cd/Zn

Liquid Barium/Cadmium/Zinc UNISTAB grade PVC stabilizers widely used in the processing of semi-rigid and flexible PVC by calendering, extrusion, injection moulding and plastisol applications. Provide very good early color, long term heat stability, high clarity and low plate out.

UNISTAB 251- General purpose, Excellent heat and light stability, Non plate out and self lubricating effect. It can be used in semi-rigid and flexible transparent and pigmented formulations.

UNISTAB 255-Cost effective, Medium efficiency, excellent long term stability and good transparency. Well suited for calendering and extrusion formulations.

UNISTAB 263-High efficiency, Excellent initial color and color hold and high clarity. Well suited for calendering and extrusion formulations.

LIQUID Ba/Zn

Liquid Barium/Zinc UNISTAB grade PVC stabilizers with self lubricating widely used in the processing of plasticized PVC by Calendering, Extrusion and Injection Moulding. They have proved successful replacements for Cadmium containing stabilizers in all semi-rigid and flexible PVC applications.

UNISTAB 117: Excellent General purpose stabilizers provide a very good balance of initial color and long term heat stability. Can be used in semi-rigid and flexible transparent and pigmented formulations.

UNISTAB 118- Medium efficiency, cost effective, excellent long term heat stability and imparts excellent early color. Designed for applications of Calendering, Extrusion of PVC formulations, both clear, filled and white pigmented.

UNISTAB 120- High efficiency, volatile solvent free, low odour, excellent heat and light stability, excellent clarity. Well suited for Calendering and extrusion applications.

LIQUID Ca/Zn

Liquid UNISTAB grade Calcium/Zinc stabilizers designed a new generation non toxic PVC stabilizers to replace Barium-Zinc type stabilizers. They are now widely used in the extrusion, calendering and rotomoulding applications of flexible PVC and plastisol.

UNISTAB 360-Medium efficiency, excellent color hold and long term heat stability. It is developed for use in extrusion, rotational casting and calendaring.

UNISTAB 361- High efficiency, non toxic, low odour, excellent long term heat stability, color hold with very good transparency. It is developed for use in PVC for toy application, food contact packaging, medical tubing and non toxic plastisol applications.