



LEAD IN SOLVENT-BASED PAINTS FOR HOME USE IN THE PHILIPPINES



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NATIONAL REPORT

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While this study was undertaken with funding assistance from the NYCT, SSNC and the Swedish Government, responsibility for the content lies entirely with IPEN and the EcoWaste Coalition. The NYCT, SSNC and the Swedish Government do not necessarily share the expressed views and interpretations.

Established in 1998, IPEN is currently comprised of over 500 Participating Organizations in 116 countries, primarily developing and transition countries. IPEN brings together leading environmental and public health groups around the world to establish and implement safe chemicals policies and practices that protect human health and the environment. IPEN's mission is a toxics-free future for all.



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PREFACE

Lead paints for home use continue to be widely produced, sold, and used in developing countries despite the fact that most highly industrial countries banned lead paints for household use more than 40 years ago. IPEN and its Participating Organizations are part of the global movement to eliminate lead paint by 2020 to protect children's health.

In 2007 and 2008, NGOs in the IPEN network collected and analyzed decorative (home use) paints on the market in 11 developing countries, and in countries with economies in transition. The results were startling. In every one of these countries, many of the paints contained dangerously high lead levels. In response, IPEN launched its Global Lead Paint Elimination Campaign, which seeks to eliminate lead in paint and raise widespread awareness among business entrepreneurs and consumers about the adverse human health impacts of lead paint, particularly on the health of children. Since then, IPEN-affiliated NGOs and others have sampled and analyzed paints on the market in more than 50 low- and middle-income countries.

This report presents new data on the total lead content of solvent-based paints for home use available on the market in the Philippines. It also presents background information on why the use of lead paint is a source of serious concern, especially to children's health; a review of national policy frameworks that are in place to ban or restrict the manufacture, import, export, distribution, sale and use of lead paint; and provides a strong justification to actively monitor the lead content of paints sold in the market to track and document progress, and to ensure full compliance to the country's lead paint regulatory controls. Finally, it proposes action steps by different stakeholders to protect children and others from lead paint.

This study was conducted by the EcoWaste Coalition in partnership with IPEN.

IPEN is an international NGO network of health and environmental organizations from all regions of the world of which the EcoWaste Coalition is a member. IPEN is a leading global organization working to establish and implement safe chemicals policies and practices to protect human health and the environment. Its mission is a toxics-free future for all. IPEN helps build the capacity of its member organizations to implement on-the-ground activities, learn from each other's work, and work at the international level to set priorities and achieve new policies.

The EcoWaste Coalition is a non-government and non-profit network of community, church, school, environmental and health groups engaged in the promotion and protection of public health and the environment toward the envisioned waste-free and toxics-free society. EcoWaste Coalition supports members' and partners' efforts addressing chemical, product, waste, climate, development and justice issues through action research, public information, campaigns, skillshares and workshops, solution demonstrations, and policy advocacy.

EXECUTIVE SUMMARY

Lead is a toxic metal that causes adverse effects on both human health and the environment. While lead exposure is also harmful to adults, lead exposure harms children at much lower levels, and the health effects are generally irreversible and can have a lifelong impact.

The younger the child, the more harmful lead can be, and children with nutritional deficiencies absorb ingested lead at an increased rate. The human fetus is the most vulnerable, and a pregnant woman can transfer lead that has accumulated in her body to her developing child. Lead is also transferred through breast milk when lead is present in a nursing mother.

Evidence of reduced intelligence caused by childhood exposure to lead has led the World Health Organization (WHO) to list “lead-caused mental retardation” as a recognized disease. WHO also lists it as one of the top ten diseases whose health burden among children is due to modifiable environmental factors.

Lead paint is a major source of childhood lead exposure. The term lead paint is used in this report to describe any paint to which one or more lead compounds have been added. The cut-off concentration for lead paint used in the report is 90 parts per million (ppm, dry weight of paint), the strictest legal limit enacted in the world today. All lead concentrations in the report are total lead levels, unless otherwise specified.

Most highly industrial countries adopted laws or regulations to control the lead content of decorative paints—the paints used on the interiors and exteriors of homes, schools, and other child-occupied facilities—beginning in the 1970s and 1980s. The Philippines promulgated its lead paint policy in 2013 through a Chemical Control Order (CCO) for Lead and Lead Compounds, which prohibits lead in paint above 90 ppm of the total non-volatile content of the dried paint film and provides for phase-out periods for different paint categories.

From June to August 2017, the EcoWaste Coalition purchased a total of 104 cans of solvent-based paint intended for home use from stores, distributors and manufacturers in 17 cities (12 in Metro Manila, two each from Cavite and Laguna, and one from Cebu) and one municipality (Santa Maria, Bulacan) in the Philippines. The paints represented 54 different brands produced by 31 manufacturers. All paints were analyzed by an accredited laboratory in the United States of America for their lead content, based on dry weight of the paint. The

laboratory participates in the Environmental Lead Proficiency Analytical Testing (ELPAT) program operated by the American Industrial Hygiene Association (AIHA), assuring the reliability of the analytical results.

RESULTS

24 out of 104 analyzed solvent-based paints for home use (23 percent of paints) were lead paints, i.e., they contained lead concentrations above 90 parts per million (ppm, dry weight of paint). This is also the regulatory limit for lead in decorative paint in e.g., Cameroon, India, Nepal, the Philippines, and the United States of America. Moreover, 12 paints (12 percent of paints) contained dangerously high lead concentrations above 10,000 ppm. The highest lead concentration detected was 100,000 ppm in a yellow Tri-Safe Paint sold for home use.

On the other hand, 80 out of 104 solvent-based paints for home use (77 percent of paints) contained lead concentrations at or below 90 ppm, suggesting that the technology to produce paint without lead ingredients exists in the Philippines.

16 out of 54 analyzed brands (30 percent of paint brands) sold at least one lead paint, i.e., a paint with lead concentration above 90 ppm. Nine out of 54 analyzed brands (17 percent of paint brands) sold at least one lead paint with dangerously high lead concentrations above 10,000 ppm.

This study shows that yellow paints most frequently contained dangerously high lead concentrations above 10,000 ppm. Of 40 yellow paints, eight (20 percent of yellow paints) contained lead levels above 10,000 ppm, and of 28 orange paints, four (14 percent of orange paints) contained lead levels above 10,000 ppm.

In general, paint can labels did not carry meaningful information about lead content or the hazards of lead paint. Only 29 out of 104 paints (28 percent of paints) provided information about lead on their labels and most paints carried little information about any ingredients on can labels. A yellow Nippon Paint Platone contained 630 ppm lead despite having a self-certified “lead free” mark on its label. Most paints were merely labeled as “solvents, pigments and resin,” with no further details on the type of solvents and pigments (organic or inorganic) provided on paint can labels. Manufacturing dates or batch numbers were included on the labels of 73 out of 104 paints (70 percent of paints) included in this study. Eighty-nine of the paint cans (86 percent of paints) indicated the flammability of the products, while only one paint can provided precautionary warnings on the effects of lead dust to children and pregnant women.

Lead levels in this study show a significant improvement from previous studies conducted by EcoWaste Coalition in 2013 and 2015. In 2015, for example, of the 141 solvent-based paints purchased and analyzed, 69 percent contained lead concentrations above 90 ppm compared to 24 percent in the current study. Also, 45 percent of the paints analyzed in 2015 were found to contain dangerously high concentrations of lead above 10,000 ppm compared to 12 percent in the current study. Thirty-nine of the 54 paint brands analyzed in this study were also analyzed in 2015. Of the 39 brands previously analyzed and included in this study, lead content above 90 ppm was detected in at least one paint of the 11 brands (six of these 11 brands had at least one paint with lead concentrations ranging from 10,000 ppm to 88,000 ppm). Out of the 15 new brands included in the 2017 study, 10 brands were found to be compliant with the 90-ppm total lead content limit.

CONCLUSIONS

This study demonstrates that availability of solvent-based paints for home use with high concentrations of lead have significantly decreased in the Philippines after the three-year phase-out of lead-containing architectural, decorative and household (ADH) paints ended in December 2016. The promulgation of the groundbreaking Chemical Control Order (CCO) for Lead and Lead Compounds in 2013 and the complementary efforts by the government, industry and civil society to push for compliance provided the impetus for most paint manufacturers to shift to non-lead raw materials and meet the deadline. Afforded with adequate time of three years to reformulate their ADH paint products without lead as pigment, drier or as an anticorrosive agent, paint manufacturers ably demonstrated the viability of eliminating lead paint in the context of a developing country like the Philippines. The fact that 80 out of 104 paints (77 percent of paints) contained lead concentrations below 90 ppm—with 67 of these 80 samples containing lead below 60 ppm—indicates that the technology to produce paints without added lead exists in the Philippines. On the other hand, the fact that 24 out of 104 paints (23 percent of the paints) had lead content exceeding 90 ppm—with 12 of these 24 paints containing dangerously high lead concentrations above 10,000 ppm—points to the need to exact compliance of all paint manufacturers to the 90 ppm regulatory limit. The study results provide a good barometer of the overall capacity of the domestic paint industry to comply with the CCO. The study results further provide a strong justification to actively monitor the lead content of paints sold in the market to track and document progress, and to ensure full compliance to the country's lead paint regulatory controls.

RECOMMENDATIONS

To address the problem of lead in paint, the EcoWaste Coalition and IPEN propose the following recommendations:

For the government and relevant agencies

Strictly enforce the Chemical Control Order (CCO) for Lead and Lead Compounds and ensure compliance to the scheduled phase-out of paints used for architectural, decorative and household applications (2013-2016) and paints used for industrial applications (2013-2019), which contain lead in excess of 90 ppm.

Establish a tripartite oversight committee to assist with the monitoring of paint industry compliance to the provisions and requirements of the CCO; conduct monitoring activities such as random inspection of paint manufacturing and distribution plants to keep compliance with the CCO in check.

Recognize compliant paint manufacturers, and provide incentives to encourage other companies to swiftly transition to non-lead paint production.

Require paint manufacturers to display sufficient information indicating toxic content on paint can labels and provide a warning on possible lead dust hazards when disturbing painted surfaces.

Facilitate workers' training on lead-safe work practices when applying paint to previously painted surfaces to minimize dispersal of lead dust.

Require the mandatory procurement of certified lead-safe paints for government purchasing.

Embark on an investigative study on lead paint hazards in the public educational system to generate data, which can help in promoting compliance to the Department of Education Order No. 4, series of 2017, directing the mandatory use of lead safe paints in all preparatory, elementary and secondary schools.

For the paint industry

Stop the use of leaded paint ingredients in paint formulations, especially for paint companies that still produce lead paints.

Obtain independent, third-party Lead Safe Paint Certification® to increase the customer's ability to choose paints that they can be confident to contain no added lead.

Provide lead-dust hazard warnings on paint can labels; provide supplementary leaflets about lead dust hazards, and methods to reduce them, that paint vendors can give to their customers.

Implement a mechanism for the retrieval of old lead-containing paints from hardware stores and other retail outlets.

For individual, household and institutional consumers

Demand paints with no added lead from paint manufacturers, as well as full disclosure of a paint product's lead content.

Ask for, consciously buy, and apply only paints with no added lead in places frequently used by children such as homes, schools, day care centers, parks and playgrounds.

Adopt a "Lead Safe Paint Procurement Policy" to ensure that only certified lead-safe paints and lead-safe products are purchased in compliance with government regulations to protect employees, customers and the public against the harmful effects of lead exposure.

For public health organizations, consumer organizations and other concerned entities

Support the elimination of lead paint, and conduct activities to inform the public and protect children from lead exposure through lead paint, lead in dust and soil, and other sources of lead.

Promote efforts to make blood lead testing available.

For all stakeholders

Support policy measures that will eliminate childhood lead exposure from all sources; join in efforts to inform the public about childhood health and occupational health risks linked with lead paints and lead dust.

Support the third-party Lead Safe Paint® certification program to help customers in making an informed choice when buying paints.

Sustain public information drive to reiterate compliance to the phase-out of lead-containing paints, and to celebrate such a historic milestone in public health.

Participate in the annual International Lead Poisoning Prevention Week of Action (ILPPWA) to highlight the hazards of lead, usually observed every fourth week of October.



ILPPWA activities in the Philippines highlight the need to protect children from lead in paint, dust and soil.

1. BACKGROUND

1.1 HEALTH AND ECONOMIC IMPACTS OF LEAD EXPOSURE

Children are exposed to lead from paint when lead-containing paint on walls, windows, doors or other painted surfaces begins to chip or deteriorate, since this process releases lead to dust and soil. Lead dust is also produced, when a surface previously painted with lead paint is sanded or scraped in preparation for repainting, very large amounts of lead-contaminated dust is produced, which can also constitute a severe health hazard.^[1]

Children playing indoors or outdoors get house dust or soil on their hands, and then ingest it through normal hand-to-mouth behavior. If the dust or the soil is contaminated with lead, the children will ingest lead. Hand-to-mouth behavior is especially prevalent in children aged six years and under, the age group most easily harmed by exposure to lead. A typical one- to six-year-old child ingests between 100 and 400 milligrams of house dust and soil each day.^[2]

In some cases, children pick up paint chips and put them directly into their mouths. This can be especially harmful because the lead content of paint chips is typically much higher than what is found in dust and soils. When toys, household furniture, or other articles are painted with lead paint, children may directly ingest the lead-contaminated, dried paint when chewing on them. Nonetheless, the most common way that children ingest lead is through lead-contaminated dust and soil that gets onto their hands.^[3]

While lead exposure is also harmful to adults, lead exposure harms children at much lower levels. In addition, children absorb up to five times as much of ingested lead than adults. Children with nutritional deficiencies absorb ingested lead at an even increased rates.^[2]

The younger the child, the more harmful lead can be and the health effects are generally irreversible and can have a lifelong impact. The human fetus is the most vulnerable, and a pregnant woman can transfer lead that has accumulated in her body to her developing child.^[4] Lead is also transferred through breast milk when lead is present in a nursing mother.^[5]

Once lead enters a child's body through ingestion, inhalation, or across the placenta, it has the potential to damage several biological systems and pathways. The primary target is the central nervous system and the brain, but lead

Lead Paint Terminology

As used in this booklet:

- “Paint” includes varnishes, lacquers, stains, enamels, glazes, primers, or coatings used for any purpose. Paint is typically a mixture of resins, pigments, fillers, solvents, and other additives.
- “Lead paint” is paint to which one or more lead compounds have been added.
- “Lead pigments” are lead compounds used to give a paint product its color.
- “Lead anti-corrosive agents” are lead compounds used to protect a metal surface from rusting or other forms of corrosion.
- “Lead driers” are lead compounds used to make paint dry more quickly and evenly.
- “Decorative paint” refers to paints that are produced for use on inside or outside walls, and surfaces of homes, schools, commercial buildings, and similar structures. Decorative paints are frequently used on doors, gates, and windows, and to repaint household furniture such as cribs, playpens, tables, and chairs.
- “Solvent-based, enamel decorative paint” or “enamel decorative paint” refers to oil-based paints.
- “ppm” means parts per million total lead content by weight in a dried paint sample. All lead concentrations in the report are total lead levels, unless otherwise specified.



can also affect the blood system, the kidneys, and the skeleton.^[6] Lead is also categorized as an endocrine-disrupting chemical (EDC).^[7]

It is generally agreed that one key element in lead toxicity is its capacity to replace calcium in neurotransmitter systems, proteins, and bone structure, altering function and structure and thereby leading to severe health impacts. Lead is also known to affect and damage cell structure.^[8]

According to the World Health Organization (WHO): “Lead has no essential role in the human body, and lead poisoning accounts for about 0.6 percent of the global burden of disease.”^[2] Evidence of reduced intelligence caused by childhood exposure to lead has led WHO to list “lead-caused mental retardation” as a recognized disease. WHO also lists it as one of the top ten diseases whose health burden among children is due to modifiable environmental factors.^[9]

In recent years, medical researchers have been documenting significant health impacts in children from lower and lower levels of lead exposure.^[2, 6] According to a factsheet on Lead Poisoning and Health from WHO: “There is no known level of lead exposure that is considered safe.”^[10]

When a young child is exposed to lead, the harm to her or his nervous system makes it more likely that the child will have difficulties in school and engage in impulsive and violent behavior.^[11] Lead exposure in young children is also linked to increased rates of hyperactivity, inattentiveness, failure to graduate from high school, conduct disorder, juvenile delinquency, drug use, and incarceration.^[2] Lead exposure impacts on children continue throughout life and have a long-term impact on a child’s work performance, and—on average—are related to decreased economic success.

A recent study investigating the economic impact of childhood lead exposure on national economies in all low- and middle-income countries estimated a total cumulative cost burden of \$977 billion international dollars* per year.^[12] The study considered the neurodevelopmental effects on lead-exposed children, as measured by reduced IQ points, and it correlated lead exposure-related reductions in children’s IQ scores to reductions in lifetime economic productivity, as expressed in lifelong earning power. The study identified many different sources of lead exposure in children, with lead paint as one major source. Broken down by region, the economic burden of childhood lead exposure as estimated by this study was:

Africa: \$134.7 billion of economic loss, or 4.03 percent of Gross Domestic Product (GDP);

Latin America and the Caribbean: \$142.3 billion of economic loss, or 2.04 percent of GDP; and

Asia: \$699.9 billion of economic loss, or 1.88 percent of GDP.

Country estimates used in this study can be accessed at a publically available website, <http://www.med.nyu.edu/pediatrics/research/environmentalpediatrics/leadexposure>, and shows that *economic loss in the Philippines is estimated at \$15 billion, or 3.8 percent of Gross Domestic Product (GDP).*

* An International dollar is a currency unit used by economists and international organizations to compare the values of different currencies. It adjusts the value of the U.S. dollar to reflect currency exchange rates, purchasing power parity (PPP), and average commodity prices within each country. According to the World Bank, “An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States.” The international dollar values in this report were calculated from a World Bank table that lists GDP per capita by country based on purchasing power parity and expressed in international dollars.

1.2 THE USE OF LEAD IN PAINT

Paints contain high levels of lead when the paint manufacturer intentionally adds one or more leaded compounds to the paint for some purpose. A paint product may also contain some amount of lead when paint ingredients contaminated with lead are used, or when there is cross-contamination from other product lines in the same factory. Leaded paint ingredients are most commonly intentionally used in solvent-based paint due to their chemical properties, and solvent-based paints have been found to have high lead content in many countries.^[13-15]

The leaded compounds most commonly added to paints are pigments. Pigments are used to give the paint its color, make the paint opaque (so it covers well), and protect the paint and the underlying surface from degradation caused by exposure to sunlight. Lead-based pigments are sometimes used alone, and sometimes used in combination with other pigments.

Leaded compounds may also be added to enamel paints for use as driers (sometimes called drying agents or drying catalysts). Leaded compounds are also sometimes added to paints used on metal surfaces to inhibit rust or corrosion. The most common of these is lead tetroxide, sometimes called red lead or minium.

Non-leaded pigments, driers, and anti-corrosive agents have been widely available for decades, and are used by manufacturers producing the highest quality paints. When a paint manufacturer does not intentionally add lead compounds in the formulation of its paints, and takes care to avoid the use of paint ingredients that are contaminated with lead, the lead content of the paint will be very low—less than 90 parts per million (ppm) lead by dry weight, and frequently down to 10 ppm or less.

Most highly industrial countries adopted laws or regulations to control the lead content of decorative paints beginning in the 1970s and 1980s. Many also imposed controls on the lead content of paints used on toys and for other applications likely to contribute to lead exposure in children. These regulatory actions were taken based on scientific and medical findings that lead paint is a major source of lead exposure in children, and that lead exposure in children causes serious harm, especially to children aged six years and under.

The use of lead in production of decorative paint is prohibited in the European Union through regulations related to safety of consumer products and specific prohibitions for most leaded raw materials. In the U.S., Canada, Australia and other countries with regulations restricting the use of leaded ingredients in decorative paint, standards specifying a maximum lead limit are in place. The

current standard for household paints in e.g., the U.S., the Philippines, and India is a total maximum lead content of 90 ppm, and adherence to this ensures that a manufacturer can sell its paint anywhere in the world. Some other countries such as Brazil, South Africa, and Sri Lanka have established standards of 600 ppm total lead.

1.3 PAINT MARKET AND REGULATORY FRAMEWORK IN THE PHILIPPINES

Paint Market in the Philippines

The paint industry of the Philippines traces its beginnings with the establishment of a Spanish-owned paint factory in 1911. After the devastating war, the country's paint industry gradually grew catalyzed by post-war construction efforts in the 1950s and the 1960s. From 18 paint manufacturers in 1969, the number grew to 75 by 1978. However, the rash of tough socio-economic and political challenges from 1989 to 1992, including a major construction slump, the uncertain supply of raw materials, high interest and inflation rates and the Gulf War, affected the paint industry's growth and progress.^[16]

Amid the ups and downs, the paint industry has grown to a PhP 30 billion^[17] industry today growing by as much as 5 to 10 percent^[18] annually. The country's thriving paint manufacturing sector produced some 290 million liters of paints,^[19] of which 70 percent is architectural and decorative paints. Water-based and solvent-based paints constitute 60 percent and 40 percent, respectively, of the country's non-industrial paint outputs.^[20]

The planned PhP 8.9 trillion infrastructure projects of the Duterte government under its flagship "Build, Build, Build"^[21] program from 2017 to 2022 should pave the way for a major construction boom across the country and provide a window of opportunity for the paint industry. The backlog in residential housing estimated at five million units^[22] offers another opportunity for the paint industry to grow. Building activities are anticipated to rise in the coming years, which will increase the demand for architectural and decorative coatings.

The Philippine Association of Paint Manufacturers (PAPM), the country's lone paint industry organization, is composed of 23 paint manufacturers and 45 raw materials suppliers. PAPM's member paint companies manufacture 95 percent of the nation's total paint output.^[23] Regionally, the PAPM is a member of the Asian Paint Industry Council (APIC) and has hosted its meetings in 2000, 2014 and 2017. APIC considers the booming economies of Indonesia, Philippines

and Vietnam as one of the major drivers for the growth of the paint market in the Association of Southeast Asian Nations (ASEAN) region.

Leading the pack of dynamic paint makers in the country are Pacific Paint (Boysen) Philippines, Inc. and Davies Paints Philippines, Inc., the first two companies in the world to obtain the Lead Safe Paint®^[24] mark under a newly-launched global third-party certification program confirming paint brands as containing less than 90 parts per million (ppm) total lead content. Boysen, in particular, accounts for 60 to 70 percent^[25] of the country's paint market and ranks as the 51st largest paint company in the world with sales topping \$230 million in 2016.^[26]

The other paint manufacturing members of PAPM are ADD Research Paints and Chemicals, Inc.; Asian Coatings Philippines, Inc.; Cambridge Paints, Inc.; Cebu 7H Technochem Industries, Inc.; Century Chemical Corp.; FH Colors and Coatings Corp.; Globesco, Inc.; Grand Aces Ventures, Inc.; March Resources Manufacturing Corp.; Mayon Industrial Corp.; Mega Paint and Coating Corp.; Nippon Paint Philippines, Inc.; Perma Colour, Inc.; Republic Chemical Industries, Inc.; Roosevelt Chemical, Inc.; Sealbond Chemical Industries, Inc.; Syewin Coatings and Wires, Inc.; Times Paint Corp.; Treasure Island Industrial Corp.; Twin Aces Industries, Inc.; and the Universal Paint and Coatings (Philippines), Inc.

Paint makers and traders not affiliated with PAPM include the Ajaycee Chemicals Trading Corp.; Andaluia Manufacturing Corp.; Breb Color Paint Station; Cameron Enterprises; Filipinas Paints and Chemicals Manufacturing, Inc.; Globe International Distributor Center Inc.; Hazz Paint and Coating Solutions, Inc.; KHI; Luffax Enterprises; Maincoat Inc.; Paradise Chemical Corp.; Prime Coating and Chemical, Inc.; RCAC Capitol Ventures Corp.; Sucat Commercial; Super Globe Inc.; Ultra Paints and Coatings Corp.; and United Paints Inc.

While local paint brands dominate the market, foreign paint brands such as Chugoku, International Paint, Oxyplast and TransOcean are also available under licensee manufacturing agreement with domestic paint companies. Jotun of Norway has built a factory scheduled to open in 2017 with an annual production target of five million liters of decorative, marine and protective paints.^[27] Ace Hardware, which opened its first store in the Philippines in 1997, offers US paint brands such as Ace Essence, Clark Kensington, Contractor PRO and Royal. In 2016, Dubai DecoMAS based in Dubai, UAE, introduced its eco-friendly MAS paint brand in the country.^[28] Also in 2016, paints and coatings giant AkzoNobel introduced Dulux specialty paints in the local market.^[29]

The Chemicals Industry Roadmap^[30] for 2012 to 2030 published by the Chemicals Industry Association of the Philippines (SPIK) with the Board of Investments and the Department of Trade and Industry provides an overview of the strengths, weaknesses, opportunities and threats facing the paint industry.

Lead Paint Regulatory Framework in the Philippines

The Department of Environment and Natural Resources (DENR), after thoughtfully consulting with key government agencies, industry groups led by the Philippine Association of Paint Manufacturers (PAPM) and civil society organizations represented by the EcoWaste Coalition and IPEN, issued DENR Administrative Order (A.O.) 2013-24,^[31] the groundbreaking legal and policy instrument regulating, limiting and prohibiting certain uses of lead and lead compounds, in the Philippines, including paint manufacturing. This A.O., also known as the Chemical Control Order for Lead and Lead Compounds (hereinafter referred to as the CCO), was promulgated on December 23, 2013.

DENR A.O. 1992-29,^[32] which outlines the Implementing Rules and Regulations of Republic Act 6969^[33] (Toxic Substances and Hazardous and Nuclear Wastes Act) and DENR. A.O. 1998-58,^[34] which specifies lead and lead compounds among the country's Priority Chemicals List (PCL), provide the legal basis for the issuance of the CCO. As per the Environmental Management Bureau (EMB), lead and lead compounds have the highest registration among the PCL chemicals from 2008 to 2011.

The CCO sets a total lead content limit of 90 parts per million (ppm) for lead used as pigment, drying agent or for some other intentional purposes in paint formulations, which is at par with the strictest mandatory standard for lead in paint in India, Nepal, and US.

As defined in the CCO, "lead paints are paints or other similar surface coating materials containing lead or lead compounds (calculated as lead metal) in excess of 0.009 percent (90 ppm) of the weight of the total non-volatile content of the weight of the dried paints film."

The CCO further establishes a three-year phase-out period (2013-2016) for lead-containing paints used for architectural, decorative and household applications and a longer phase-out period of six-years (2013-2019) for such paints used for industrial applications.

The CCO applies to importers, distributors, manufacturers, industrial users, recyclers as well as waste service providers such as transporters, treaters and disposers. It strictly prohibits the use of lead and lead compounds in the pro-

duction of packaging for food and drink, fuel additives, water pipes, toys, school supplies, cosmetics, and paints.

In 2015 and 2016, the EMB issued two Memorandum Circulars (MCs) clarifying certain prohibited uses of lead and lead compounds as listed in the CCO.

EMB MC 2015-005^[35] clarified the use of lead and lead compounds is prohibited in food and beverage packaging materials that come directly in contact with food. It reiterated the prohibition on lead in fuel additives and gasoline for motor vehicles in line with Republic Act 8749^[36] (Clean Air Act), which bans leaded gasoline effective in 2000. This MC affirmed that lead water pipes are prohibited, but allows the use of lead as stabilizer in the manufacture of polyvinyl chloride (PVC) water pipes on condition that it complies with the Philippine National Standard 65-1993 on PVC pipes used for potable water supply.

EMB MC 2016-010^[37] clarified the use of paints with over 90 ppm lead content in children's products, including home furnishings, shall be prohibited by December 31, 2016.

The CCO also contains pertinent provisions such as Section 5 on "General Requirements and Procedures," which requires "labeling conforming to the provisions of Globalized Harmonized System (GHS) and a warning label stating that lead dust is hazardous for children, pregnant women and the elderly people."

Section 8 on "Compliance and Monitoring Procedure" states: "The EMB Regional Offices shall monitor compliance based on duly accomplished and submitted Self Monitoring Report (SMR) per DAO No. 27, Series of 2003 (Amending DAO 26, DAO 29 and AO 2000-81) and the EMB Central Office shall integrate the regional monitoring report for management action. In any complaints of non-compliance, sampling and testing (if necessary) shall be made using a method that conforms to good laboratory practices (GLP). The concentrations of total lead present in a surface coating of dried sample must not be more than 90 ppm."

Section 11 on "Transitory Provision" says "lead in paints shall be allowed for the next six years (2013-2019) as transitional provision provided precautionary labeling is placed in the (following) products: (1) automobile paints, (2) industrial and commercial building and equipment maintenance coatings, (3) refinishing coatings for industrial equipment, (4) catalyzed coatings for use on radio-controlled model powered airplanes, and (5) touch-up coatings for appliances and lawn and garden equipment."

Section 12 on "Penalty Provision" provides: "Any violation of the requirements specified in this Order shall subject the person(s) liable thereof to the applicable

administrative and criminal sanctions as provided for under Sections 41 and 43 of DAO 1992-29 and DENR MC 2005-003^[38] (Prescribing Graduated Administrative Fines Pursuant to RA 6969 and DENR A.O. 1992-29).”

Reflecting the consultative nature by which the CCO was developed, Section 10 on “Capacity Building” states that the following government agencies and parties shall be duly consulted towards the effective implementation of the order: Food and Drug Administration of the Department of Health, Bureau of Product Standardization and Bureau of Trade Relation and Consumer Protection of the Department of Trade and Industry, Bureau of Customs of the Department of Finance, the Philippine Association of Paint Manufacturers, and the EcoWaste Coalition and IPEN.

Excerpt from a DENR letter to the EcoWaste Coalition:

“The DENR would like to acknowledge the valuable inputs of the EcoWaste Coalition in the formulation of this policy, your commitment to collaborate with DENR to promote this CCO and your staunch advocacy on chemical safety, sustainable consumption and lifestyle at the national and international arenas. Thence, we look forward to working with EcoWaste Coalition in information, education and communication (IEC) programs to promote industrial compliance and public awareness on this DAO and on the hazards posed by the use and release of lead and lead compounds in the workplace and into the environment.”

Following the phase-out of lead-containing architectural, decorative and household paints, other government departments responding to the appeal from the EcoWaste Coalition adopted regulations mainstreaming the use of lead safe paints in their areas of jurisdiction.

The Department of Education issued Department Order 4, series of 2017^[39] requiring the mandatory use of lead safe paints in all preparatory, elementary and secondary schools. It states: “The use of independently certified lead-safe paints/coatings shall be mandatory to all painting and/or repainting works of: school facilities (buildings, amenities, other structures), furniture, fixtures, learning materials, and tools and equipment.” The Department had previously issued Memorandum 85, series of 2016^[40] stating “the use of lead-free paints in schools must be observed at all times, especially during the conduct of activities related to Brigada Eskwela and other preparations for the opening of classes.”

The Department of Social Work and Development issued a memorandum requiring the use of lead safe paints as a mandatory requirement in facilities

catering to disadvantaged and vulnerable sectors. According to the memorandum, “the (DSWD) Standards Bureau/Unit shall ensure compliance by all social welfare and development agencies that their residential and non-residential facilities, including furniture, fixture and equipment, are using lead-safe paints or coatings prior to licensing or re-accreditation.”

2. MATERIALS AND METHODS

From June to August 2017, 104 cans of solvent-based paint intended for home use were purchased by the EcoWaste Coalition from various stores, distributors and manufacturers in 17 cities and one municipality in Metro Manila and the provinces of Bulacan, Cavite, Cebu and Laguna, Philippines. The paints represented 54 different brands produced by 31 manufacturers.

In most cases, two bright-colored paints such as yellow, orange or red were selected. The availability of these paints in retail establishments suggested that they were intended to be used within home environments. Excluded were automotive and industrial paints that are not typically used for domestic housing applications.

During the paint sample preparation, information such as color, brand, manufacturer, country where manufactured, product codes, production dates, and other details as provided on the label of the paint can were recorded. Generic paint colors were recorded, e.g., “yellow” instead of “sunflower.” For all colored paints, the protocol called for obtaining “bright” or “strong” yellow, orange or red paints when available.

Paint sampling preparation kits containing individually numbered, untreated wood pieces, single-use paintbrushes and stirring utensils made from untreated wood sticks were procured and assembled locally by the staff of the EcoWaste Coalition.

Each can of paint was thoroughly stirred and was subsequently applied onto individually numbered duplicates of untreated, labeled wood pieces using different unused, single-use paintbrushes by researchers of the EcoWaste Coalition as shown in Figure 1.

Each stirring utensil and paintbrush was used only for the same paint, and extra caution was taken to avoid cross contamination. All samples were then allowed to dry at room temperature for five to six days. After drying, the painted wood pieces were placed in individually labeled, resealable plastic bags and shipped for analysis of lead content to Forensic Analytical Laboratories, Inc. in the United States of America. The laboratory participates in the Environmental Lead Proficiency Analytical Testing (ELPAT) Program operated by the American Industrial Hygiene Association. In the laboratory selection process, IPEN further assessed the reliability of the laboratory results by conducting



Figure 1: Paint samples being prepared by EcoWaste Coalition staff.

an independent quality assurance testing. This was made by sending paint samples with a known lead content to the laboratory, and evaluating the results received.

The laboratory's lower limit of detection for the lead concentration in the paint samples is dependent on the amount of paint in the samples. Generally, the lowest detection limit for the method used is 60 ppm, but if only a small amount of paint is available, the detection limit increases.

The paint samples were analyzed using method EPA3050B/7000B, i.e., through acid digestion of the samples, followed by Flame Atomic Absorption Spectrometry, which is recognized by the WHO as the appropriate lead content analysis for this purpose.^[41]

3. RESULTS

3.1 SUMMARY OF RESULTS

This study shows that:

- 24 out of 104 analyzed solvent-based paints (23 percent of paints) were lead paints, i.e., they contained lead concentrations above 90 parts per million (ppm), dry weight. In addition, 12 paints (12 percent of paints) contained dangerously high lead concentrations above 10,000 ppm.
- 16 out of 54 analyzed brands (30 percent of paint brands) sold at least one lead paint, i.e., a paint with lead concentration above 90 ppm. Also, nine out of 54 analyzed brands (17 percent of paint brands) sold at least one lead paint with dangerously high lead concentrations above 10,000 ppm.
- 20 out of 88 bright-colored paints (23 percent of bright-colored paints) were lead paints, i.e., they contained lead concentrations above 90 parts per million (ppm), dry weight. Yellow paints were the most hazardous with eight out of 40 paints (20 percent of yellow paints) containing lead concentrations greater than 10,000 ppm, and four out of 28 orange paints (14 percent of orange paints) also contained dangerously high lead concentrations above 10,000 ppm.
- The highest lead concentration detected was 100,000 ppm in a yellow Tri-Safe Quick Drying Enamel Paint sold for home use.
- Only 29 out of 104 paints (28 percent of paints) provided information about lead on their labels and most paints carried little information about ingredients. A yellow Nippon Paint Platone contained 630 ppm lead despite having a self-certified “lead free” mark on its label. Most paints were merely labeled as “solvents, pigments and resin,” with no further details on the type of solvents and pigments (organic or inorganic) provided. Eighty-nine of the paint cans (86 percent of paints) indicated the flammability of the products, while only one paint can provided precautionary warnings on the effects of lead dust to children and pregnant women.

3.2 LEAD CONTENT ANALYSIS

Twenty-four out of 104 analyzed solvent-based paints (23 percent of paints) were lead paints, i.e., contained a lead concentration above 90 ppm —12 of these contained dangerously high lead concentrations above 10,000 ppm (12 percent of paints).

A yellow Tri-Safe Paint contained the highest concentration of lead at 100,000 ppm, while the lowest concentration of lead less than 60 ppm was detected in 67 paints (Table 7, Appendix).

The ten solvent-based paints with the highest amounts of lead are summarized in Table 1.

TABLE 1. TOP TEN SOLVENT-BASED PAINTS WITH THE HIGHEST LEAD CONTENT.

Rank	Brand	Manufacturer (Country of Manufacturer)	Color	Lead Content (ppm)
1	Tri-Safe	Sucat Commercial (Philippines)	Yellow	100,000
2	Challenger	Mayon Industrial Corp.(Philippines)	Yellow	88,000
3	Orient	Prime Coating and Chemical, Inc. (Philippines)	Yellow	61,000
4	Orient	Prime Coating and Chemical, Inc. (Philippines)	Orange	60,000
5	Next	RCAC Capitol Ventures Corp.(Philippines)	Yellow	59,000
6	Sunrise	Cameron Enterprise (Philippines)	Yellow	50,000
7	Next	RCAC Capitol Ventures, Corp. (Philippines)	Orange	47,000
8	Filipinas	Filipinas Paints and Chemicals Manufacturing Co., Inc. (Philippines)	Yellow	43,000
9	Rigid	Prime Coating and Chemical, Inc. (Philippines)	Yellow	42,000
10	Filipinas	Filipinas Paints and Chemicals Manufacturing Co., Inc. (Philippines)	Orange	19,000

3.3 PAINT BRAND ANALYSIS

Twelve out of 54 analyzed brands (22 percent of paint brands) sold at least one paint with dangerously high lead concentration above 10,000 ppm.

Among solvent-based decorative paints, a yellow Tri-Safe Paint contained the highest concentration of lead at 100,000 ppm. On the other hand, at least one

paint from each of the 50 brands studied contained lead below 90 ppm (Table 8, Appendix). This indicates that the technology to produce paints without added lead exists in the Philippines.

3.4 PAINT COLOR ANALYSIS

Twenty out of 88 bright-colored paints (23 percent of bright-colored paints) such as yellow, orange, red and green contained lead concentrations above 90 ppm, 12 paints of which contained dangerously high lead concentrations above 10,000 ppm (14 percent of bright-colored paints).

This study included 40 yellow paints, 28 orange paints, 18 red paints, 12 white paints, two green paints, two brown paints, one aluminum paint, and one black paint. Yellow and orange paints contained the highest lead concentrations.

Among bright-colored paints, 11 out of 40 yellow paints (28 percent of yellow paints) contained lead concentrations above 90 ppm, eight paints of which exceeded more than 10,000 ppm of lead (20 percent of yellow paints), while six out of 28 orange paints (21 percent of orange paints) contained lead concentrations above 90 ppm, four paints of which exceeded more than 10,000 ppm of lead (14 percent of orange paints). Three out of 18 red paints (17 percent of red paints) contained lead concentrations above 90 ppm.

The distribution of lead concentrations in different colors is shown in Figure 2.

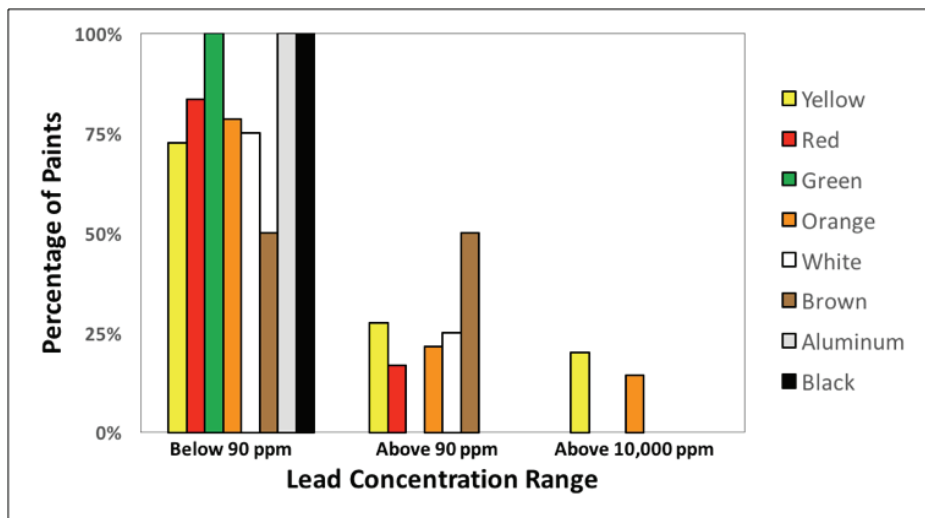


Figure 2. Distribution of Lead Concentrations in Home-Use Solvent-based Paints by Color.

3.5 LABELING

In general, most paint can labels did not carry meaningful information about lead content or the hazards of lead paint.

Only 29 out of 104 paints (28 percent of paints) provided information about lead on their labels and most paint can labels carried little information about any ingredients. A yellow Nippon Paint Platone contained 630 ppm lead despite having a “lead free” mark on its label. Most paints were merely labeled as “solvents, pigments and resin,” with no further details on the type of solvents and pigments (organic or inorganic) provided on paint can labels.

Manufacturing dates or batch numbers were included on the labels of 73 out of 104 paints (70 percent of paints) included in this study. Manufacturing date or batch number information written in a comprehensible manner can help consumers in avoiding purchase of older products that may still contain lead additives. Eighty-nine of the paint cans (86 percent of paints) indicated the flammability of the products, while only one paint can provided precautionary warnings on the effects of lead dust to children and pregnant women.

3.6 COMPARISON WITH RESULTS FROM AN EARLIER STUDY

Lead levels in this study show an improvement from previous studies conducted by EcoWaste Coalition in 2013 and 2015. In 2015, for example, of the 141 solvent-based paints purchased and analyzed, 69 percent contained lead concentrations above 90 ppm compared to 24 percent in the current study. Also, 45 percent of the paints analyzed in 2015 were found to contain dangerously high concentrations of lead above 10,000 ppm compared to 12 percent in the current study. Thirty-nine of the 54 paint brands analyzed in this study were also analyzed in 2015. Of the 39 brands previously analyzed and included in this study, lead content above 90 ppm was detected in at least one paint of the 11 brands (six of these 11 brands had at least one paint with lead concentrations ranging from 10,000 ppm to 88,000 ppm). Out of the 15 new brands included in the 2017 study, 10 brands were found to be compliant with the 90-ppm total lead content limit.

TABLE 2: COMPARISON ON LEAD CONTENT IN SOLVENT-BASED PAINTS FROM EARLIER STUDIES.

	2017 Study	2015 Study	2013 Study
Number of Paints	104	141	122
Percentage of paints with lead content > 90 ppm (number of paints)	23 (24)	69 (97)	61 (75)
Percentage of paints with lead content \geq 10,000 ppm (number of paints)	12 (12)	45 (63)	39 (48)
Maximum Concentration, ppm	100,000	153,000	156,000

Comparing the three studies undertaken in 2013, 2015 and 2017 (Figure 3) shows a significant increase on the percentage of paints with lead levels below 90 ppm—from 39 percent in 2013, 31 percent in 2015, to 76 percent in 2017. Also, a significant decrease on the percentage of paints with dangerously high lead levels above 10,000 ppm can be observed (from 39 percent in 2013, 45 percent in 2015, to 12 percent in 2017).

The decrease on the percentage of lead paint available in the market is primarily due to individual paint companies removing lead in decorative paint formulations in compliance with the mandatory phase-out requirements under the DENR Chemical Control Order for Lead and Lead Compounds.

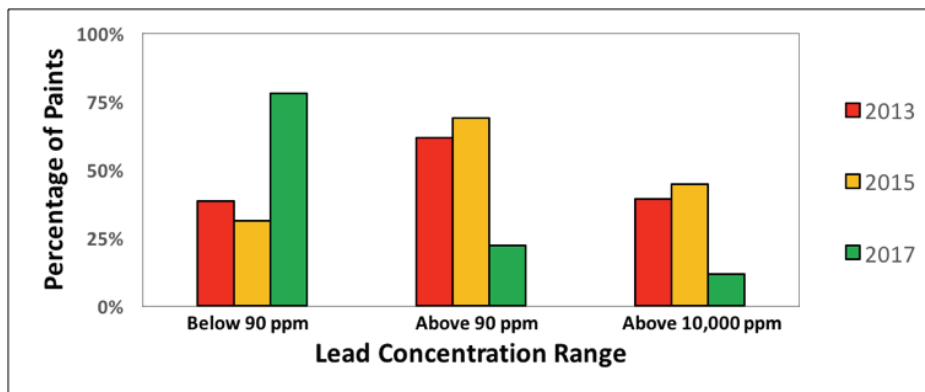


Figure 3. Comparison of three successive paint studies showing a gradual increase on the percentage of paints below 90 ppm, and a consequent decrease on the percentage of paints above 90 ppm and 10,000 ppm.

4. CONCLUSIONS AND RECOMMENDATIONS

This study demonstrates that solvent-based paints for home use with high concentrations of lead have significantly decreased in the Philippines after the three-year phase-out of lead-containing architectural, decorative and household (ADH) paints ended in December 2016. The promulgation of the groundbreaking Chemical Control Order (CCO) for Lead and Lead Compounds in 2013 and the complementary efforts by the government, industry and civil society to push for compliance provided the impetus for paint manufacturers to shift to non-lead raw materials and meet the deadline. Afforded with adequate time of three years to reformulate their ADH paint products without lead as pigment, drier or as an anticorrosive agent, paint manufacturers ably demonstrated the viability of eliminating lead paint in the context of a developing country like the Philippines. The fact that 80 out of 104 paints (77 percent of paints) contained lead concentrations below 90 ppm—with 67 of these 80 samples containing lead levels below 60 ppm—indicates that the technology to produce paints without added lead exists in the Philippines. On the other hand, the fact that 24 out of 104 paints (23 percent of paints) had lead content exceeding 90 ppm—with 12 of these 24 paints containing dangerously high lead concentrations above 10,000 ppm—points to the need to exact compliance of all paint manufacturers to the 90-ppm regulatory limit. The study results provide a good barometer of the overall capacity of the domestic paint industry to comply with the CCO. The study results further provide a strong justification to actively monitor the lead content of paints sold in the market to track and document progress, and to ensure full compliance to the country's lead paint regulatory controls.

To address the problem of lead in paint, the EcoWaste Coalition and IPEN propose the following recommendations:

For the government and relevant agencies

Strictly enforce the Chemical Control Order (CCO) for Lead and Lead Compounds and ensure compliance to the scheduled phase-out of paints used for architectural, decorative and household applications (2013-2016) and paints

used for industrial applications (2013-2019), which contain lead in excess of 90 ppm.

Establish a tripartite oversight committee to assist with the monitoring of paint industry compliance to the provisions and requirements of the CCO; conduct monitoring activities such as random inspection of paint manufacturing and distribution plants to keep compliance with the CCO in check.

Recognize compliant paint manufacturers, and provide incentives to encourage other companies to swiftly transition to non-lead paint production.

Require paint manufacturers to display sufficient information indicating toxic content on paint can labels and provide a warning on possible lead dust hazards when disturbing painted surfaces.

Facilitate workers' training on lead-safe work practices when applying paint to previously painted surfaces to minimize dispersal of lead dust.

Require the mandatory procurement of certified lead-safe paints for government purchasing.

Embark on an investigative study on lead paint hazards in the public educational system to generate data, which can help in promoting compliance to the Department of Education Order No. 4, series of 2017, directing the mandatory use of lead safe paints in all preparatory, elementary and secondary schools.

For the paint industry

Stop the use of leaded paint ingredients in paint formulations, especially for paint companies that still produce lead paints.

Obtain independent, third-party Lead Safe Paint Certification® to increase the customer's ability to choose paints that they can be confident to contain no added lead.

Provide lead-dust hazard warnings on paint can labels; provide supplementary leaflets about lead dust hazards, and methods to reduce them, that paint vendors can give to their customers.

Implement a mechanism for the retrieval of old lead-containing paints from hardware stores and other retail outlets.

For individual, household and institutional consumers

Demand paints with no added lead from paint manufacturers, as well as full disclosure of a paint product's lead content.

Ask for, consciously buy, and apply only paints with no added lead in places frequently used by children such as homes, schools, day care centers, parks and playgrounds.

Adopt a “Lead Safe Paint Procurement Policy” to ensure that only certified lead safe paints and lead safe products are purchased in compliance with government regulations to protect employees, customers and the public against the harmful effects of lead exposure.

For public health organizations, consumer organizations and other concerned entities

Support the elimination of lead paint, and conduct activities to inform the public and protect children from lead exposure through lead paint, lead in dust and soil, and other sources of lead.

Promote efforts to make blood lead testing available.

For all stakeholders

Support policy measures that will eliminate childhood lead exposure from all sources; join in efforts to inform the public about childhood health and occupational health risks linked with lead paints and lead dust.

Support the third-party Lead Safe Paint® certification program to help customers in making an informed choice when buying paints.

Sustain public information drive to reiterate compliance to the phase-out of lead-containing paints, and to celebrate such a historic milestone in public health.

Participate in the annual International Lead Poisoning Prevention Week of Action (ILPPWA) to highlight the hazards of lead, usually observed every fourth week of October.

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APPENDIX

TABLE 3. SOLVENT-BASED PAINTS FOR HOME USE INCLUDED IN THE STUDY.

Sample No.	Brand	Color	Volume (L)	Price (PHP)	Batch No.	Date of Purchase (y/m/d)	Is there website on label?
PHL-441	Admix Sure Coat	Moly Orange	4	590.00	N/A	06/20/17	No
PHL-442	A-Plus	Orange	4	650.00	17040734	06/03/17	Yes
PHL-443	A-Plus	International Red	1	150.00	17020731	06/07/17	Yes
PHL-444	Boysen	Lemon Yellow	1	199.75	03171411M	06/01/17	Yes
PHL-445	Boysen	Orange	1	274.75	04171732M	06/01/17	Yes
PHL-446	Brebwise	Lemon Yellow	4	480.00	N/A	06/06/17	No
PHL-447	Brebwise	Moly Orange	4	480.00	N/A	06/06/17	No
PHL-448	Canadian	Yellow	4	580.00	16029487	06/03/17	No
PHL-449	Canadian	Orange	4	580.00	17050324	06/15/17	No
PHL-450	Challenger	Lemon Yellow	0.06	25.00	N/A	06/03/17	No
PHL-451	Challenger	Red	0.06	25.00	N/A	06/03/17	No
PHL-452	Coat Saver	Caterpillar Yellow	1	149.75	10500269	06/01/17	No
PHL-453	Coat Saver	Orange	1	160.00	10580873	06/04/17	No
PHL-454	ColorQuick	Lemon Yellow	0.25	44.00	17022704	06/21/17	Yes
PHL-455	ColorQuick	Orange	0.25	44.00	17022704	06/21/17	Yes
PHL-456	Dallas	Lemon Yellow	4	580.00	10121601	06/03/17	No
PHL-457	Dallas	Moly Orange	4	580.00	10121601	06/03/17	No
PHL-458	Davies	Lemon Yellow	1	160.00	10580873	06/04/17	No
PHL-459	Davies	Orange	1	221.50	10440073	06/03/17	No
PHL-460	Destiny Paint	White	1	188.00	8269115	06/06/17	No
PHL-461	Destiny Paint	Bulletin Red	0.06	50.00	207317	06/19/17	No
PHL-462	Domino 2000	Lemon Yellow	4	460.00	4067039	06/06/17	No
PHL-463	Domino 2000	Orange	4	460.00	(05047010	06/06/17	No
PHL-464	Durax	Lemon Yellow	4	460.00	11273	06/03/17	No

Sample No.	Brand	Color	Volume (L)	Price (PHP)	Batch No.	Date of Purchase (y/m/d)	Is there website on label?
PHL-465	Durax	California Orange	4	480.00	11273	06/03/17	No
PHL-466	Dutch Boy	Lemon Yellow	1	200.00	(02171314M	06/03/17	Yes
PHL-467	Dutch Boy	International Red	1	180.00	(02171314M	06/03/17	Yes
PHL-468	Elegancia	White	4	450.00	(01011817	06/19/17	No
PHL-469	Euro Paint	White	4	450.00	N/A	06/20/17	No
PHL-470	Euro Paint	International Red	1	125.00	N/A	06/09/17	No
PHL-471	E-Z Coat	Yellow	4	490.00	1025062_	06/13/17	No
PHL-472	E-Z Coat	Signal Red	4	490.00	10460705	06/06/17	No
PHL-473	Filipinas Paints	Yellow	4	725.10	N/A	06/23/17	No
PHL-474	Filipinas Paints	Orange	4	738.00	N/A	06/23/17	No
PHL-475	Globe	Yellow	0.06	29.75	(01131763	06/02/17	No
PHL-476	Globe	Green	0.06	29.75	(01241752	06/06/17	No
PHL-477	Hudson	Lemon Yellow	0.25	69.75	16440922	06/03/17	No
PHL-478	Hudson	International Red	0.25	65.00	16280825	06/03/17	No
PHL-479	Kansas	Aluminum	4	511.00	(09160532	06/25/17	No
PHL-480	Lotus	Yellow	0.06	25.00	N/A	06/09/17	No
PHL-481	Lotus	Red	0.06	20.00	N/A	06/04/17	No
PHL-482	Macnell	White	4	530.00	N/A	06/08/17	No
PHL-483	Manor	Lemon Yellow	4	510.00	17010187	06/06/17	No
PHL-484	Manor	Orange	4	510.00	17010187	06/06/17	No
PHL-485	Marine	Lemon Yellow	4	460.00	N/A	06/10/17	No
PHL-486	Master	Lemon Yellow	0.25	59.00	N/A	06/06/17	No
PHL-487	Master	Orange	0.25	59.00	N/A	06/06/17	No
PHL-488	Meyer	White	4	350.00	17010187	06/10/17	No
PHL-489	Minnesota	Lemon Yellow	4	480.00	(03171291	06/03/17	No
PHL-490	Minnesota	Orange	4	480.00	(03171291	06/03/17	No
PHL-491	Nation	White	1	150.00	10162825M	06/12/17	Yes
PHL-492	Nation	Brown	1	130.00	(04171221M	06/06/17	Yes
PHL-493	Next	Lemon Yellow	4	535.00	20542	06/06/17	No

Sample No.	Brand	Color	Volume (L)	Price (PHP)	Batch No.	Date of Purchase (y/m/d)	Is there website on label?
PHL-494	Next	Moly Orange	4	535.00	20202	06/06/17	No
PHL-495	Nippon Paint 9000	Sunflower	1	328.00	1703102120 (white base)	06/02/17	Yes
PHL-496	Nippon Paint 9000	Orange	1	328.00	1703102120 (white base)	06/02/17	Yes
PHL-497	Nippon Paint Platone	Jasmine Yellow	1	280.00	1608056104	06/14/17	Yes
PHL-498	Nippon Paint Platone	Sunrise Orange	1	292.00	1608126111	06/14/17	Yes
PHL-499	Olympic	Lemon Yellow	0.25	49.75	17220119	06/03/17	Yes
PHL-500	Olympic	Mandarin Red	0.25	50.00	17110323	06/05/17	Yes
PHL-501	Orient	Lemon Yellow	4	405.00	N/A	06/09/17	No
PHL-502	Orient	California Orange	4	395.00	N/A	06/09/17	No
PHL-503	Platinum	Moly Orange	4	530.00	16040913	06/09/17	No
PHL-504	Platinum Rubberized Undercoat	Black	4	390.00	(04081601	06/25/17	No
PHL-505	Popular	Lemon Yellow	4	560.00	17060211808	06/14/17	Yes
PHL-506	Popular	Moly Orange	4	560.00	17033010347	06/14/17	Yes
PHL-507	Prime-Coat Paint	White	4	460.00	99002066	06/06/17	No
PHL-508	Princeton	White	4	580.00	N/A	06/14/17	No
PHL-509	Pure-Coat Advance	Light Yellow	0.25	112.00	1116-023-1; 0317-070-1 (white base)	06/06/17	No
PHL-510	Pure-Coat Advance	Bulletin Red	0.25	89.00	0317-037-1; 0317-070-1 (white base)	06/06/17	No
PHL-511	Rigid	Lemon Yellow	4	530.00	N/A	06/09/17	No
PHL-512	Rigid	International Red	4	470.00	N/A	06/09/17	No
PHL-513	Rosco	Lemon Yellow	4	540.00	99002066	06/06/17	No
PHL-514	Rosco	Red	4	540.00	99002066	06/06/17	No
PHL-515	Sea Bird	Lemon Yellow	4	560.00	11191607	06/23/17	No
PHL-516	Sea Bird	Moly Orange	4	580.00	N/A	06/09/17	No

Sample No.	Brand	Color	Volume (L)	Price (PHP)	Batch No.	Date of Purchase (y/m/d)	Is there website on label?
PHL-517	Seasons	White	4	430.00	10050086	06/06/17	No
PHL-518	Sinclair	Hansa Yellow	0.25	99.75	8956037; 81157128 (white base)	06/02/17	Yes
PHL-519	Sinclair	Venetian Red	0.25		8368088	06/23/17	Yes
PHL-520	Sphero	Lemon Yellow	4	610.00	17010187	06/06/17	No
PHL-521	Sphero	California Orange	4	830.00	17010187	06/06/17	No
PHL-522	Sunrise	Lemon Yellow	0.08	25.00	N/A	06/17/17	No
PHL-523	Sunrise	Baby Pink	0.08	25.00	N/A	06/08/17	No
PHL-524	Super Savers	Lemon Yellow	1	165.00	(0617076	06/08/17	Yes
PHL-525	Super Savers	International Red	1	180.00	(0617075	06/08/17	Yes
PHL-526	Texas	Orange	4	480.00	2160317	06/13/17	No
PHL-527	Texas	International Red	4	480.00	3250317	06/17/17	No
PHL-528	Tri-Safe Paint	Lemon Yellow	4	595.00	N/A	06/06/17	No
PHL-529	Tri-Safe Paint	Moly Orange	4	595.00	N/A	06/06/17	No
PHL-530	Triton	Sun Yellow	1	160.00	10580873	06/04/17	No
PHL-531	Triton	Orange	1	150.00	99000984	06/11/17	No
PHL-532	Triton Red Leed Paint	Red Orange	1	160.00	99000882	06/10/17	No
PHL-533	Universal Plus	Lemon Yellow	4	520.00	17031010870	06/07/17	Yes
PHL-534	Universal Plus	Moly Orange	4	580.00	17022710342	06/10/17	Yes
PHL-535	Universal Premium Professional	White	4	560.00	17032510291	06/12/17	Yes
PHL-536	Weiser	Lemon Yellow	0.25	59.00	N/A	06/06/17	No
PHL-537	Weiser	Orange	0.25	59.00	N/A	06/06/17	No
PHL-538	Welcoat	Lemon Yellow	1	168.00	3890317	06/01/17	Yes
PHL-539	Welcoat	International Red	1	142.00	N/A	06/04/17	Yes
PHL-540	Welcoat Premium	White	1	182.00	N/A	06/10/17	No
PHL-541	Welcoat Premium	Caramel Brown	1	150.00	4200517	06/18/17	No
PHL-542	Trend	White	4	440.00	(080317	08/28/17	No

Sample No.	Brand	Color	Volume (L)	Price (PHP)	Batch No.	Date of Purchase (y/m/d)	Is there website on label?
PHL-543	Venkot	Lemon Yellow	4	520.00	N/A	08/26/17	No
PHL-544	Venkot	Thalo Green	4	480.00	N/A	08/26/17	No

TABLE 4. RESULTS OF LABORATORY ANALYSIS OF SOLVENT-BASED PAINTS FOR HOME USE.

Sample No.	Brand	Color	Lead Content, Dry Weight (ppm)	Country of Brand Headquarters	Country of Manufacture	Is there information on can about lead content of paint?
PHL-441	Admix Sure Coat	Moly Orange	< 60	Philippines	Philippines	N/A
PHL-442	A-Plus	Orange	< 60	Philippines	Philippines	N/A
PHL-443	A-Plus	International Red	< 60	Philippines	Philippines	N/A
PHL-444	Boysen	Lemon Yellow	< 60	Philippines	Philippines	N/A
PHL-445	Boysen	Orange	< 60	Philippines	Philippines	N/A
PHL-446	Brebwise	Lemon Yellow	< 60	Philippines	Philippines	N/A
PHL-447	Brebwise	Moly Orange	< 60	Philippines	Philippines	N/A
PHL-448	Canadian	Yellow	130	Philippines	Philippines	N/A
PHL-449	Canadian	Orange	< 60	Philippines	Philippines	N/A
PHL-450	Challenger	Lemon Yellow	88,000	Philippines	Philippines	N/A
PHL-451	Challenger	Red	< 60	Philippines	Philippines	N/A
PHL-452	Coat Saver	Caterpillar Yellow	< 60	Philippines	Philippines	N/A
PHL-453	Coat Saver	Orange	< 60	Philippines	Philippines	N/A
PHL-454	ColorQuick	Lemon Yellow	< 60	Philippines	Philippines	No Added Lead
PHL-455	ColorQuick	Orange	< 60	Philippines	Philippines	No Added Lead
PHL-456	Dallas	Lemon Yellow	< 60	Philippines	Philippines	Lead Safe Paint (illegal use)
PHL-457	Dallas	Moly Orange	70	Philippines	Philippines	Lead Safe Paint (illegal use)
PHL-458	Davies	Lemon Yellow	< 60	Philippines	Philippines	N/A
PHL-459	Davies	Orange	< 60	Philippines	Philippines	N/A
PHL-460	Destiny Paint	White	120	Philippines	Philippines	N/A
PHL-461	Destiny Paint	Bulletin Red	90	Philippines	Philippines	N/A
PHL-462	Domino 2000	Lemon Yellow	< 60	Philippines	Philippines	N/A
PHL-463	Domino 2000	Orange	< 60	Philippines	Philippines	N/A

Sample No.	Brand	Color	Lead Content, Dry Weight (ppm)	Country of Brand Headquarters	Country of Manufacture	Is there information on can about lead content of paint?
PHL-464	Durax	Lemon Yellow	< 60	Philippines	Philippines	N/A
PHL-465	Durax	California Orange	< 60	Philippines	Philippines	N/A
PHL-466	Dutch Boy	Lemon Yellow	< 60	Philippines	Philippines	Lead Free
PHL-467	Dutch Boy	International Red	< 60	Philippines	Philippines	Lead Free
PHL-468	Elegancia	White	70	Philippines	Philippines	N/A
PHL-469	Euro Paint	White	< 60	Philippines	Philippines	N/A
PHL-470	Euro Paint	International Red	< 60	Philippines	Philippines	N/A
PHL-471	E-Z Coat	Yellow	250	Philippines	Philippines	N/A
PHL-472	E-Z Coat	Signal Red	< 60	Philippines	Philippines	N/A
PHL-473	Filipinas Paints	Yellow	43,000	Philippines	Philippines	N/A
PHL-474	Filipinas Paints	Orange	19,000	Philippines	Philippines	N/A
PHL-475	Globe	Yellow	< 60	Philippines	Philippines	Contains Lead
PHL-476	Globe	Green	< 60	Philippines	Philippines	Contains Lead
PHL-477	Hudson	Lemon Yellow	< 60	Philippines	Philippines	N/A
PHL-478	Hudson	International Red	< 60	Philippines	Philippines	N/A
PHL-479	Kansas	Aluminum	60	Philippines	Philippines	Lead-Free
PHL-480	Lotus	Yellow	< 60	Philippines	Philippines	N/A
PHL-481	Lotus	Red	< 90	Philippines	Philippines	N/A
PHL-482	Macnell	White	< 60	Philippines	Philippines	N/A
PHL-483	Manor	Lemon Yellow	< 60	Philippines	Philippines	N/A
PHL-484	Manor	Orange	< 60	Philippines	Philippines	N/A
PHL-485	Marine	Lemon Yellow	< 60	Philippines	Philippines	Lead-Free
PHL-486	Master	Lemon Yellow	< 60	Philippines	Philippines	N/A
PHL-487	Master	Orange	< 70	Philippines	Philippines	N/A

Sample No.	Brand	Color	Lead Content, Dry Weight (ppm)	Country of Brand Headquarters	Country of Manufacture	Is there information on can about lead content of paint?
PHL-488	Meyer	White	60	Philippines	Philippines	Lead Safe Paint (illegal use)
PHL-489	Minnesota	Lemon Yellow	< 60	Philippines	Philippines	Lead Free
PHL-490	Minnesota	Orange	< 60	Philippines	Philippines	Lead Free
PHL-491	Nation	White	70	Philippines	Philippines	N/A
PHL-492	Nation	Brown	< 60	Philippines	Philippines	N/A
PHL-493	Next	Lemon Yellow	59,000	Philippines	Philippines	Contains Lead
PHL-494	Next	Moly Orange	47,000	Philippines	Philippines	Contains Lead
PHL-495	Nippon Paint 9000	Sunflower	< 60	Malaysia	Malaysia	Non-added Lead
PHL-496	Nippon Paint 9000	Orange	< 60	Malaysia	Malaysia	Non-added Lead
PHL-497	Nippon Paint Platone	Jasmine Yellow	630	Malaysia	Malaysia	Lead and Chrome Free
PHL-498	Nippon Paint Platone	Sunrise Orange	< 60	Malaysia	Malaysia	Lead and Chrome Free
PHL-499	Olympic	Lemon Yellow	< 60	Philippines	Philippines	N/A
PHL-500	Olympic	Mandarin Red	< 60	Philippines	Philippines	N/A
PHL-501	Orient	Lemon Yellow	61,000	Philippines	Philippines	N/A
PHL-502	Orient	California Orange	60,000	Philippines	Philippines	N/A
PHL-503	Platinum	Moly Orange	10,000	Philippines	Philippines	N/A
PHL-504	Platinum Rubberized Undercoat	Black	80	Philippines	Philippines	Contains Lead
PHL-505	Popular	Lemon Yellow	< 60	Philippines	Philippines	N/A
PHL-506	Popular	Moly Orange	< 60	Philippines	Philippines	N/A
PHL-507	Prime-Coat Paint	White	< 60	Philippines	Philippines	N/A
PHL-508	Princeton	White	< 60	Philippines	Philippines	N/A

Sample No.	Brand	Color	Lead Content, Dry Weight (ppm)	Country of Brand Headquarters	Country of Manufacture	Is there information on can about lead content of paint?
PHL-509	Pure-Coat Advance	Light Yellow	< 60	Philippines	Philippines	Lead-Free
PHL-510	Pure-Coat Advance	Bulletin Red	< 60	Philippines	Philippines	Lead-Free
PHL-511	Rigid	Lemon Yellow	42,000	Philippines	Philippines	N/A
PHL-512	Rigid	International Red	130	Philippines	Philippines	N/A
PHL-513	Rosco	Lemon Yellow	< 60	Philippines	Philippines	N/A
PHL-514	Rosco	Red	< 60	Philippines	Philippines	N/A
PHL-515	Sea Bird	Lemon Yellow	< 60	Philippines	Philippines	Lead Safe Paint (illegal use)
PHL-516	Sea Bird	Moly Orange	70	Philippines	Philippines	Lead Safe Paint (illegal use)
PHL-517	Seasons	White	< 60	Philippines	Philippines	N/A
PHL-518	Sinclair	Hansa Yellow	< 60	Philippines	Philippines	N/A
PHL-519	Sinclair	Venetian Red	< 60	Philippines	Philippines	N/A
PHL-520	Sphero	Lemon Yellow	< 60	Philippines	Philippines	N/A
PHL-521	Sphero	California Orange	160	Philippines	Philippines	N/A
PHL-522	Sunrise	Lemon Yellow	50,000	Philippines	Philippines	N/A
PHL-523	Sunrise	Baby Pink	5,800	Philippines	Philippines	N/A
PHL-524	Super Savers	Lemon Yellow	70	Philippines	Philippines	N/A
PHL-525	Super Savers	International Red	< 60	Philippines	Philippines	N/A
PHL-526	Texas	Orange	400	Philippines	Philippines	N/A
PHL-527	Texas	International Red	< 60	Philippines	Philippines	N/A
PHL-528	Tri-Safe Paint	Lemon Yellow	100,000	Philippines	Philippines	N/A
PHL-529	Tri-Safe Paint	Moly Orange	90	Philippines	Philippines	N/A
PHL-530	Triton	Sun Yellow	< 60	Philippines	Philippines	N/A

Sample No.	Brand	Color	Lead Content, Dry Weight (ppm)	Country of Brand Headquarters	Country of Manufacture	Is there information on can about lead content of paint?
PHL-531	Triton	Orange	< 60	Philippines	Philippines	N/A
PHL-532	Triton Red Lead Paint	Red Orange	< 70	Philippines	Philippines	N/A
PHL-533	Universal Plus	Lemon Yellow	< 60	Philippines	Philippines	N/A
PHL-534	Universal Plus	Moly Orange	< 60	Philippines	Philippines	N/A
PHL-535	Universal Premium Professional	White	< 60	Philippines	Philippines	N/A
PHL-536	Weiser	Lemon Yellow	< 60	Philippines	Philippines	N/A
PHL-537	Weiser	Orange	< 60	Philippines	Philippines	N/A
PHL-538	Welcoat	Lemon Yellow	18,000	Philippines	Philippines	Contains Lead
PHL-539	Welcoat	International Red	3,200	Philippines	Philippines	Contains Lead
PHL-540	Welcoat Premium	White	5,400	Philippines	Philippines	Contains Lead
PHL-541	Welcoat Premium	Caramel Brown	4,500	Philippines	Philippines	Contains Lead
PHL-542	Trend	White	600	Philippines	Philippines	Contains Lead
PHL-543	Venkot	Lemon Yellow	< 60	Philippines	Philippines	N/A
PHL-544	Venkot	Thalo Green	< 60	Philippines	Philippines	N/A

TABLE 5. DISTRIBUTION OF LEAD CONCENTRATION BY BRAND.

Brand	No. of Samples	No. of Samples Above 90 ppm	No. of Samples Above 10,000 ppm	Minimum Lead Content (ppm)	Maximum Lead Content (ppm)
Admix Sure Coat	1 (orange)	0	0	< 60	< 60
A-Plus	2	0	0	< 60	< 60
Boysen	2	0	0	< 60	< 60
Brebwise	2	0	0	< 60	< 60
Canadian	2	1	0	< 60	130
Challenger	2	1	1	< 60	88,000
Coat Saver	2	0	0	< 60	< 60
ColorQuick	2	0	0	< 60	< 60
Dallas	2	0	0	< 60	70
Davies	2	0	0	< 60	< 60
Destiny Paint	2	1	0	90	120
Domino 2000	2	0	0	< 60	< 60
Durax	2	0	0	< 60	< 60
Dutch Boy	2	0	0	< 60	< 60
Elegancia	1 (white)	0	0	70	70
Euro Paint	2	0	0	< 60	< 60
E-Z Coat	2	1	0	< 60	250
Filipinas Paint	2	2	2	19,000	43,000
Globe	2	0	0	< 60	< 60
Hudson	2	0	0	< 60	< 60
Kansas	1 (aluminum)	0	0	60	60
Lotus	2	0	0	< 60	< 90
Macnell	1 (white)	0	0	< 60	< 60
Manor	2	0	0	< 60	< 60
Marine	1 (yellow)	0	0	< 60	< 60
Master	2	0	0	< 60	< 70
Meyer	1 (white)	0	0	60	< 60
Minnesota	2	0	0	< 60	< 60

Brand	No. of Samples	No. of Samples Above 90 ppm	No. of Samples Above 10,000 ppm	Minimum Lead Content (ppm)	Maximum Lead Content (ppm)
Nation	2	0	0	< 60	70
Next	2	2	2	47,000	59,000
Nippon Paint	4	1	0	< 60	630
Olympic	2	0	0	< 60	< 60
Orient	2	2	2	60,000	61,000
Platinum	2	1	1	80	10,000
Popular	2	0	0	< 60	< 60
Prime-Coat Paint	1 (white)	0	0	< 60	< 60
Princeton	1 (white)	0	0	< 60	< 60
Pure-Coat Advance	2	0	0	< 60	< 60
Rigid	2	2	1	130	42,000
Rosco	2	0	0	< 60	< 60
Sea Bird	2	0	0	< 60	70
Seasons	1 (white)	0	0	< 60	< 60
Sinclair	2	0	0	< 60	< 60
Sphero	2	1	0	< 60	160
Sunrise	2	2	1	5,800	50,000
Super Savers	2	0	0	< 60	70
Texas	2	1	0	< 60	400
Trend	1 (white)	1	0	600	600
Tri-Safe Paint	2	1	1	90	100,000
Triton	3	0	0	< 60	< 70
Universal	3	0	0	< 60	< 60
Venkot	2	0	0	< 60	< 60
Weiser	2	0	0	< 60	< 60
Welcoat	4	4	1	3,200	18,000

TABLE 6. DISTRIBUTION OF LEAD CONCENTRATION BY COLOR.

Color	No. of Samples	No. of Samples Above 90 ppm	No. of Samples Above 10,000 ppm	Minimum Lead Content (ppm)	Maximum Lead Content (ppm)
Aluminum	1	0	0	60	60
Black	1	0	0	80	80
Brown	2	1	0	< 60	4,500
Green	2	0	0	< 60	< 60
Orange	28	6	4	< 60	60,000
Red	18	3	0	< 60	5,800
Yellow	40	11	8	< 60	100,000
White	12	3	0	< 60	5,400

TABLE 7. LIST OF BRANDS WITH AT LEAST ONE PAINT CONTAINING THE LOWEST LEAD CONCENTRATION BELOW 60 PPM.

Paint Brand	Color
Admix Sure Coat	orange
A-Plus	orange, red
Boysen	orange, yellow
Brebwise	orange, yellow
Canadian	orange
Challenger	red
Coat Saver	orange, yellow
ColorQuick	orange, yellow
Dallas	yellow
Davies	orange, yellow
Domino 2000	orange, yellow
Durax	orange, yellow
Dutch Boy	red, yellow

Paint Brand	Color
Euro Paint	red, white
E-Z Coat	red
Globe	green, yellow
Hudson	red, yellow
Lotus	yellow
Macnell	white
Manor	orange, yellow
Marine	yellow
Master	yellow
Minnesota	orange, yellow
Nation	brown
Nippon Paint 9000	orange, yellow
Nippon Paint Platone	orange
Olympic	red, yellow
Popular	orange, yellow
Prime-Coat Paint	white
Princeton	white
Pure-Coat Advance	red, yellow
Rosco	red, yellow
Sea Bird	yellow
Seasons	white
Sinclair	red, yellow
Sphero	yellow
Super Savers	red
Texas	red
Triton	orange, yellow
Universal Plus	orange, yellow
Universal Premium Professional	white
Weiser	orange, yellow
Venkot	green, yellow

TABLE 8. LIST OF BRANDS WITH AT LEAST ONE PAINT COMPLIANT WITH THE 90-PPM TOTAL LEAD CONTENT LIMIT.

Paint Brand	Color
Admix Sure Coat	orange
A-Plus	orange, red
Boysen	orange, yellow
Brebwise	orange, yellow
Canadian	orange
Challenger	red
Coat Saver	orange, yellow
ColorQuick	orange, yellow
Dallas	orange, yellow
Davies	orange, yellow
Destiny Paint	red
Domino 2000	orange, yellow
Durax	orange, yellow
Dutch Boy	red, yellow
Elegancia	white
Euro Paint	red, white
E-Z Coat	red
Globe	green, yellow
Hudson	red, yellow
Kansas	aluminum
Lotus	red, yellow
Macnell	white
Manor	orange, yellow
Marine	yellow
Master	orange, yellow
Meyer	white
Minnesota	orange, yellow
Nation	brown, white

Paint Brand	Color
Nippon Paint 9000	orange, yellow
Nippon Paint Platone	orange
Olympic	red, yellow
Platinum Rubberized Undercoat	black
Popular	orange, yellow
Prime-Coat Paint	white
Princeton	white
Pure-Coat Advance	red, yellow
Rosco	red, yellow
Sea Bird	orange, yellow
Seasons	white
Sinclair	red, yellow
Sphero	yellow
Super Savers	red, yellow
Texas	red
Tri-Safe Paint	orange
Triton	orange, yellow
Triton Red Leed Paint	red
Universal Plus	orange, yellow
Universal Premium Professional	white
Weiser	orange, yellow
Venkot	green, yellow



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