



# NATIONAL REPORT LEAD IN NEW ENAMEL HOUSEHOLD PAINTS IN THE PHILIPPINES: THE 2015 REPORT

June 2015



 **EcoWaste Coalition**  
[www.ecowastecoalition.org](http://www.ecowastecoalition.org)



European Union



a toxics-free future





PRINCETON PREMIUM QUALITY ARCHITECTURAL PAINT  
 PURE-COAT LEAD-FREE QUICK DRYING ENAMEL WHITE  
 SEA BIRD QUICK DRYING ENAMEL  
 SPHERO PREMIUM PAINT QUICK DRY ENAMEL INT'L RED  
 SUPER SAVERS QUICK DRY ENAMEL ORANGE

DALLAS QUICK DRYING ENAMEL  
 DAVIES GLOSS-IT Quick Dry Enamel  
 DENNY'S QUALITY PAINT QUICK DRYING ENAMEL  
 DOMINO 2000 QUICK DRY ENAMEL  
 macnells ARCHITECTURAL FINISHES

HUDSON  
 ISLAND ENAMEL  
 NATION  
 NIPPON PAINT ODORLESS GLOSS FINISH  
 ROSCO PAINT MARINE QUICK DRYING ENAMEL

HUDSON  
 ISLAND PAINT  
 MASTER  
 SYMPIC  
 ORIENT  
 ROSCO PAINT

MASTER  
 SYMPIC  
 ORIENT  
 ROSCO PAINT



**NATIONAL REPORT**

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HOUSEHOLD PAINTS  
IN THE PHILIPPINES:  
**THE 2015 REPORT**

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# National Report

## Lead in New Enamel Household Paints in the Philippines: The 2015 Report

June 2015

### Acknowledgement

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This report was produced as part of the Asian Lead Paint Elimination Project. The Asian Lead Paint Elimination Project was established to eliminate lead in paint and raise widespread awareness among business entrepreneurs and consumers about the adverse human health impacts of lead-based household enamel paints, particularly on the health of children under six years old.

The Asian Lead Paint Elimination Project is being implemented by IPEN over a period of three years in seven countries (Bangladesh, India, Indonesia, Nepal, Philippines, Sri Lanka, and Thailand) with funding from the European Union (EU) totaling 1.4 million euros. While this report has been produced with the assistance of the European Union, its contents are the sole responsibility of the Ecological Waste Coalition of the Philippines, Inc. (EcoWaste Coalition) together with IPEN, and can in no way be taken to reflect the views of the European Union. In addition, this report was produced with financial contributions from the Swedish Environment Protection Agency and Swedish public development co-operation aid through the Swedish Society for Nature Conservation (SSNC). The views herein shall not necessarily be taken to reflect the official opinion of any of these donors, including SSNC or its donors.

## **Waste Coalition**

The EcoWaste Coalition is a national network of more than 150 public interest groups working on waste, climate, chemical, social justice and development issues. It envisages a zero waste and toxics-free Philippines and strives to attain such a vision by fostering and supporting activism around priority concerns in line with the people's constitutional rights to health and to a balanced and healthful ecology.

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# Abbreviations

## Organizations and Other Entities

APIC	Asian Paint Industry Council
ASEAN	Association of Southeast Asian Nations
CPSC	United States Consumer Product Safety Commission
DENR	Philippine Department of Environment and Natural Resources
DepEd	Philippine Department of Education
DOH	Philippine Department of Health
EMB	Philippine Environmental Management Bureau
EU	European Union
IPEN	International POPs Elimination Network
NGO	Non-Government Organization
PAPM	Philippine Association of Paint Manufacturers
SSNC	Swedish Society for Nature Conservation
WHO	World Health Organization

## Technical Terms

AO	Administrative Order
CCO	Chemical Control Order for Lead and Lead Compounds
DAO	Department Administrative Order
ELPAT	Environmental Lead Proficiency Analytical Testing
GDP	Gross Domestic Product
GHS	Globalized Harmonized System
GLP	Good Laboratory Practice
ICP	Inductively Coupled Plasma Spectroscopy
IEC	Information, Education and Communication
IQ	Intelligence Quotient
PhP	Philippine Peso
ppm	part per million
QDE	Quick-Dry Enamel
SMR	Self-Monitoring Report



## Preface

Leaded paints for home use continue to be widely produced, sold and used in developing countries despite the fact that most highly industrial countries banned leaded house paints more than 40 years ago.

In 2007 and 2008, NGOs in the IPEN network collected and analyzed decorative (home use) paints on the market in 11 developing countries and countries with transitional economies. The results were startling. In every one of these countries, many of the paints had dangerously high lead content. In response, IPEN launched a worldwide lead paint elimination campaign. Since then, IPEN-affiliated NGOs and others have sampled and analyzed paints on the market in approximately 40 low- and middle-income countries.<sup>a</sup> In every country where there was no law or regulation prohibiting the use of lead in paint, the paints had high, and often, dangerously high lead content.

This 2015 National Report on Lead Paint presents new data on the lead content of decorative enamel paints that are offered for sale in the Philippine market. This is the fourth time that the EcoWaste Coalition has analyzed paints sold in the Philippines for their lead content. Previous studies were conducted in 2008 (25 paints, including 15 enamel paints from 14 brands), 2010 (35 paints, including 26 enamel paints from nine brands), and 2013 (122 enamel paints from 34 brands). These studies found that the vast majority of the enamel paints contained lead concentrations above 90 parts per million (ppm), the threshold limit for lead in paint adopted in December 2013 by the Philippine Government. Nor would they be allowed to be sold in most industrialized countries.

In addition to new data on lead in paint, the report also presents background information on why the present and former use of decorative enamel paints with high lead content is a source of serious concern, especially to children's health. It also proposes action steps by different stakeholders to protect children and other vulnerable groups from lead paint and lead dust.



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a. Information about the indicated countries and studies can be found at <http://ipen.org/documents/worldwide-data-lead-paint-2015>.





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## Executive Summary

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 considers it as one of the top ten diseases whose health burden among children is due to modifiable environmental factors.

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. In the Philippines, lead paint regulation was promulgated in December 2013 through a Chemical Control Order for Lead and Lead Compounds (hereinafter referred to as the CCO) issued by the Department of Environment and Natural Resources (DENR). The CCO strictly prohibits the use of lead in paints or other similar surface coating materials containing lead or lead in excess of 0.009 percent (90 ppm) of the weight of the total non-volatile content of the dried paint film.

From October to December 2014, the EcoWaste Coalition purchased a total of 140 cans of solvent-based enamel decorative paint from stores in 11 cities in Metro Manila, Cebu and Pampanga in the Philippines. The paints were from 44 paint brands. The paints were selected because (1) they were shown to contain lead above 90 ppm in the 2013 study (24 brands), or (2) because they had not previously been analyzed for their total lead content. Paints shown to contain lead below 90 ppm in earlier studies were not included in this study. All paints were analyzed by accredited laboratories in Europe for their total lead content, based on dry weight of the paint. This is the fourth and most extensive study that the EcoWaste Coalition has conducted regarding lead content of new decorative enamel paints in the Philippines.

The paint study was undertaken as part of the Asian Lead Paint Elimination Project. The Asian Lead Paint Elimination Project carries out focused activities to eliminate lead paint from the market in seven project countries—Bangladesh, India, Indonesia, Nepal, Philippines, Sri Lanka and Thailand.

### Findings

Lead concentrations above the regulatory standard of 90 ppm (dry weight) were found in 97 out of 140 enamel decorative paints (69 percent of the paints), which may render young children and pregnant women at risk of lead poisoning. If exported, these paints will not be permitted for sale in most industrialized countries. Dangerously high lead concentrations greater than 10,000 ppm were detected in 63 enamel decorative paints (45 percent of the paints). A lemon yellow quick-dry enamel paint contained the highest total lead concentration of 153,000 ppm. On the other hand, 43 paints (31 percent of the paints) contained lead concentrations below the 90 ppm regulatory standard.

Lead concentrations above 90 ppm were detected in at least one paint from 35 out of 44 analyzed paint brands (80 percent of paint brands). Extremely high lead concentrations above 10,000 ppm were detected in at least one paint from 27 paint brands (61 percent of paint brands). On the other hand, lead concentrations below 90 ppm were detected in at least one paint from 21 paint brands (48 percent of paint brands), suggesting that these brands have the capability to produce paints with lead content below 90 ppm.

Lead concentrations above 90 ppm were detected in at least one paint from 14 out of 18 not previously analyzed paint brands (78 percent of new paint brands), and lead concentrations above 10,000 ppm were detected in at least one paint from 11 of these paint brands (61 percent of new paint brands). Conversely, lead concentrations below 90 ppm were detected in at least one paint from seven brands not previously studied.

Lead concentrations greater than 90 ppm were found in 85 out of 116 bright-colored paints (73 percent of bright-colored paints), i.e., orange, red, yellow, green and blue, 63 paints of which contained lead concentrations above 10,000 ppm (54 percent of bright-colored paints).

Paint can labels contained insufficient information. Product ingredients, including whether the product contained lead, were not fully disclosed; manufacturing and expiration dates were not explicitly displayed; and warning signs indicating that lead dust are hazardous to children and pregnant women were not specified. Labels indicating “lead-free,” “non-added lead,” and “zero lead” claims were not supported by independent, third-party certification declarations.

Lead concentrations below 90 ppm were found in 12 out of 15 paints which explicitly carried “lead-free,” “non-added lead,” and “zero lead” claims on their labels. Three paints from one brand with “zero lead” claims on their labels contained lead concentrations ranging from 13,800 to 46,000 ppm.

Reduction in lead content to below 90 ppm was found in 13 out of 47 paints analyzed in 2013. In addition, 10 out of 24 brands included in both studies had reduced lead content in one or more of their paints to below 90 ppm.

A lemon yellow quick-dry enamel paint with the second highest lead content in 2013 at 126,000 ppm, registered a vast 99.77 percent lead content reduction to 290 ppm in this study.

## **Conclusions**

Since the EcoWaste Coalition began studying the lead content of paints sold in the Philippines in 2008, most paint brands with the largest market share, including the top two brands—Boysen and Davies—have shown a significant reduction in the amount of lead in their sampled products. This demonstrates that paint with low lead content can be produced cost-effectively in the Philippines, and that some companies are willing and able to make the shift.

In 2013, six years after the work began and after six revisions, the CCO for Lead and Lead Compounds was officially approved by DENR Secretary Ramon J.P. Paje. These actions demonstrate that government officials have become aware of the danger lead paint poses to young children and the nation’s economy, and are willing to prevent childhood lead exposure.

Though the advocacy of the EcoWaste Coalition has raised awareness on the hazards of lead paint among consumers, it remains virtually impossible for consumers to identify which paints contain unacceptable levels of lead, since most companies do not provide information on their labels and those that do cannot be independently verified.

Nevertheless, paints with high lead levels, especially those manufactured by small- and medium-sized manufacturers, remain available in many hardware shops and paint centers in the country. These producers often face special barriers in shifting to low lead products and may require additional technical information, better access to suppliers of non-lead paint ingredients, and other types of help in reformulating their products.



## **Recommendations**

- **For the government and relevant agencies:** Strictly enforce the CCO for Lead and Lead Compounds towards the successful implementation of the prohibited uses of lead and the targeted phase-out of leaded decorative paints by 2016 and leaded industrial paints by 2019. Establish a multi-stakeholders' oversight committee to assist with the monitoring of compliance to the provisions and requirements of the CCO. Provide incentives to paint companies to swiftly transition from lead to non-lead paint production. Require paint can labels with sufficient information indicating the lead content and provide a warning on possible lead dust hazards when disturbing painted surfaces. Promote mandatory lead safe paint for government purchasing. Facilitate workers' training on lead-safe work practices when applying paint to previously painted surfaces to minimize dispersal of lead dust. For the Department of Education (DepEd), along with the Department of Environment and Natural Resources (DENR), the Department of Health (DOH) and public interest stakeholders, to embark on an investigative study on lead paint hazards in the public educational system.
- **For the paint industry:** Support small- and medium-sized paint companies in their efforts to transition to non-lead paint production even before the targeted phase-out dates. Participate in the third-party "Lead Safe Paint Certification" program to help consumers differentiate paints that are compliant with the 90 ppm lead in paint regulatory standard and those that are not. 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.
- **For individual, household and institutional consumers:** Ask for certified lead safe paints for healthier homes and patronize businesses that sell unleaded paints. Be aware of lead paint and dust hazards, and precautions to take to minimize them.
- **For public health organizations:** 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. Promote efforts to make blood lead testing available. Encourage specification of "lead safe paints" on purchase orders of larger paint consumers such as schools, day-care centers and large housing property owners or managers.
- **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 "lead safe paint" procurement policies. Support a third-party certification and labeling program that will ensure all paints sold in the market meet the regulatory standard of 90 ppm and help customers in having an informed choice when buying paints.





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# 1. Background

## Health and Economic Impact of Lead Exposure

Children are exposed to lead from paint when deteriorating paint on walls, windows, doors or other painted surfaces begins to chip or deteriorate and lead is released to dust and soil. When a surface previously painted with lead paint is sanded or scraped in preparation for repainting, very large amounts of lead-contaminated dusts also are produced and spread and can constitute a severe health hazard.<sup>1</sup>

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 house dust or the soil is contaminated with lead, the children 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.<sup>2</sup>

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 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 chew on them and directly ingest the lead-contaminated, dried paint. Nonetheless, the most common way that children ingest lead is through lead-contaminated dust and soil that gets onto their hands.<sup>3</sup>

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.<sup>4</sup> The younger the child, the more harmful lead can be, and children with nutritional deficiencies absorb ingested lead at an increased rate.<sup>5</sup> The human fetus is the most vulnerable, and a pregnant woman can transfer lead that has accumulated in her body to her developing child.<sup>6</sup> Lead is also transferred through breast milk when lead is present in a nursing mother.<sup>7</sup>

Once lead enters a child's body through ingestion, inhalation, or across the placenta, it has the potential to damage a number of biological systems and pathways. The primary target is the central nervous system and the brain, but lead can also affect the blood system, the kidneys, and the skeleton.<sup>8</sup>

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.<sup>9</sup>

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."<sup>10</sup> 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.<sup>11</sup>

In recent years, medical researchers have been documenting significant health impacts in children from lower levels of lead exposure.<sup>12,13</sup> According to WHO, "there is no known safe level of exposure to lead."<sup>14</sup>

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.<sup>15</sup> 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.<sup>16</sup> 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<sup>b</sup> per year.<sup>17</sup> 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
- Asia: \$699.9 billion of economic loss or 1.88 percent of GDP (Philippines: \$15.0 billion of economic loss or 3.8 percent of GDP)

## The Use of Lead in Paint

Lead is a toxic metal that is found in some paints.

Paints contain 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. Water-based paints are rarely contaminated with lead, but solvent-based enamel paints have been found to have high lead content in many countries.<sup>18</sup>

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 occasionally used alone, but are 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 catalysts). Sometimes, leaded compounds are also 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) total 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—the paints used on the interiors and exteriors of homes, schools and other child-occupied facilities—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

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b. 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. The data from the table (at: <http://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD>) was accessed by the report's authors in February 2012.

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 the U.S. and Canada is 90 ppm, and adherence to this ensures that a manufacturer can sell its paint anywhere in the world. Some other countries have established standards of 600 ppm.

## **Paint Market and Regulatory Framework in the Philippines**

### ***Paint Market in the Philippines***

The country's paint industry came into being in 1911 with the establishment of a Spanish-owned factory.<sup>19</sup> Today, the paint industry is valued at PhP 30-billion.<sup>20</sup> The industry continues to thrive as the economy continues to show resilience amid the devastation caused by super typhoons and other natural calamities, the never-ending political skirmishes and scandals, and intermittent peace and security concerns.

Along with the flourishing economies of Indonesia and Vietnam, the Philippines is regarded as one of the major drivers of the Association of Southeast Asian Nations (ASEAN) paint market in the future, with the regional bloc's collective GDP predicted to grow by 250 percent in the next 20 years, as reported by the Asian Paint Industry Council (APIC).<sup>21</sup> The Philippines offers a broad spread of opportunities for the coatings industry, especially in terms of civil construction, architectural, marine and protective applications.<sup>22</sup>

According to the Philippine Association of Paint Manufacturers (PAPM), the local paint industry grows by 5 to 10 percent yearly with estimated total paint volume in 2013 reaching 270 million liters, of which 70 percent is decorative paints, which is further split to 40 percent solvent-based decorative paints and 60 percent water-based decorative paints.<sup>23</sup>

The top ten paint manufacturers cover roughly 90 percent of the total paint market,<sup>24</sup> with Pacific Paint (Boysen) Philippines, Inc. accounting for 60 to 70 percent of the nation's premium paint market.<sup>25</sup> In July 2014, the magazine Coatings World ranked Boysen as the 54th largest paint company in the world with sales topping \$230 million in 2013.<sup>26</sup> Other top paint manufacturers in the country include Davies Paints Philippines, Inc. and Asian Coatings Philippines, Inc.

As announced in May 2014, Nippon Paint Philippines, Inc., the only multinational paint company with a local paint manufacturing plant, received PhP 100 million in investment from Nippon Paint Malaysia Group with the goal of PhP 1.5 billion in sales revenue in the next three years.<sup>27</sup>

Other foreign brands such as Chugoku, International Paint, Jotun Powder Coatings, Oxyplast and Trans-Ocean are supplied under licensee manufacturing agreement with the local paint companies, according to the PAPM.<sup>28</sup>

PAPM, the lone paint industry association, founded in 1961, is currently comprised of 74 member companies, including 23 paint manufacturers, namely:

ADD Research Paints and Chemicals, Inc.; Asian Coatings Philippines, Inc.; Cambridge Paints, Inc.; Cebu 7H Technochem Industries, Inc.; Century Chemical Corp.; Davies Paints Philippines, Inc.; FH Colors and Coatings Corp.; Globesco, Inc.; March Resources Manufacturing Corp.; Mayon Industrial Corp.; Mega Paint and Coating Corp.; Nippon Paint Philippines, Inc.; Pacific Paint (Boysen) Philippines, Inc.; Perma Colour, Inc.; Philippine Paint Manufacturers, Inc.; Republic Chemical Industries, Inc.; Roosevelt Chemical, Inc.; Sealbond Chemical Industries, Inc.; Sycwin Coating and Wires, Inc.; Times Paint Corp.; Treasure Island Industrial Corp.; Twin Aces Industries, Inc.; and the Universal Paint and Coatings (Philippines), Inc.

Paint manufacturing plants are located mostly in Metro Manila and adjacent provinces in the island of Luzon, with the exception of Cebu 7H Technochem Industries, Inc. and Treasure Island Industrial Corp., both based in Mandaue City in the Visayas.

## **Lead Paint Regulatory Framework**

After years of consulting with various stakeholders from the government, the industry and the civil society, Environment and Natural Resources Secretary Ramon J.P. Paje signed the DENR Administrative Order (AO) 2013-24, also known as the Chemical Control Order for Lead and Lead Compounds,<sup>29</sup> on 23 December 2013. The CCO is a policy issuance by the DENR that seeks to prohibit, limit or regulate the use, manufacture, import, export, transport, process, storage, disposal, possession and sale of priority chemicals that the agency has determined as posing serious risks to public health, the workplace and the environment. Aside from lead, the DENR has issued CCOs for cyanide in 1997, mercury in 1997, asbestos in 2000, ozone depleting substances in 2000 and polychlorinated biphenyls in 2004.

As provided for in Section 4 on “Prohibited Use,” the CCO strictly prohibits the use of lead in the production of (1) packaging for food and drink, (2) fuel additives, (3) water pipes, (4) toys, (5) school supplies, (6) cosmetics, and (7) paints. 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 establishes a phase-out period of three years (2013-2016) for architectural, decorative and household paints, and six years (2013-2019) for industrial paints that contain lead used as pigment, drying agent or for some intentional purpose above the threshold limit of 90 ppm.

The CCO covers importers, distributors, manufacturers, industrial users, recyclers as well as waste service providers such as transporters, treaters and disposers.

Other provisions relevant to lead in paint include:

Section 5 on “General Requirements and Procedures” 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 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) refinish 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 8 on “Compliance and Monitoring Procedure” states: “The Environmental Management Bureau (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 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 92-29 and DENR Memorandum Circular No. 2005-003 (Prescribing Graduated Administrative Fines Pursuant to Republic Act No. 6969 and DENR Administrative Order No. 29, Series of 1992).”

Secretary Paje, recognizing the active and affirmative role played by the civil society in the development and completion of the CCO, sent the following letter to the EcoWaste Coalition and IPEN:

*“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.”*



## 2. Materials and Methods

From October to December 2014, the EcoWaste Coalition purchased a total of 140 cans of solvent-based enamel decorative paints from various stores in 11 cities in Metro Manila, Cebu and Pampanga in the Philippines. These paints from 44 different brands were produced by 29 manufacturers. In most cases, the EcoWaste Coalition selected one white paint and one or more bright-colored paint such as yellow, orange or red. 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 or for painting toys.

During the paint sample preparation, information such as color, brand, manufacturer, country of origin, purchase details, product codes, and production date as provided on the label of the paint can were recorded. The formats used for production dates varied with some companies providing day, month and year and others providing only month and year. In addition, some paint companies used only a single word to describe some colors, such as “red,” while others used “international red.” Colors were recorded as provided on the can. For the red and yellow paints, the protocol called for obtaining “bright” or “strong” colors of red and yellow when available. Dates of purchase were recorded in the day/month/year format in most cases.

Paint sampling preparation kits containing individually numbered, untreated wood pieces, single-use paint brushes and stirring utensils made from untreated wood sticks were assembled and shipped to the EcoWaste Coalition by the staff of the IPEN partner NGO, Arnika, in the Czech Republic.



**Figure 1.** Preparation of Paint Samples.

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

Each stirring utensil and paintbrush was used only once, 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 individual resealable plastic bags and shipped to ELPAT (Environmental Lead Proficiency Analytical Testing program) participating laboratories in Europe for analysis of total lead content of dry weight of the paint. The paint samples were analyzed using method CPSC-CH-E1003-09 (Inductively Coupled Plasma (ICP) spectroscopy), as recognized both by WHO and the United States Consumer Product Safety Commission (CPSC) as appropriate for the purpose.<sup>30,31</sup>

## 3. Results and Discussion

### Summary of Results

#### Overall Findings

- **Lead concentrations above 90 ppm were found in samples from 97 solvent-based enamel decorative paints (69 percent of paints), 63 paints of which contained dangerously high concentrations of lead greater than 10,000 ppm (45 percent of paints).** These 63 paints can be considered a major public health hazard by exposing young children and pregnant women at risk of lead poisoning. These paints will not be allowed for sale in most international markets.
- **Lead concentrations below 90 ppm were found in samples from 43 solvent-based enamel decorative paints (31 percent of paints), 22 paints of which contained lead concentrations below 10 ppm.**
- **A lemon yellow quick-dry enamel paint contained the highest total lead concentration of 153,000 ppm, 1,700 times greater than the regulatory standard limit of 90 ppm.**
- **Lead concentrations above 90 ppm were detected in samples from at least one paint from 35 out of 44 analyzed paint brands (80 percent of paint brands),** while extremely high lead concentrations above 10,000 ppm were detected in samples from at least one paint from 27 paint brands (61 percent of paint brands).
- **Lead concentrations below 90 ppm were detected in samples from at least one paint from 21 paint brands (48 percent of paint brands),** suggesting that these brands have the capability to produce paints with lead content below 90 ppm.
- **Lead concentrations greater than 90 ppm were found in samples from 85 out of 116 bright-colored paints (73 percent of bright-colored paints), i.e., orange, red, yellow, green and blue.**

#### Comparison with 2013 Lead Paint Study

- **Reduction in lead content to below 90 ppm was found in 13 out of 47 paints analyzed in both 2013 and 2015.** A lemon yellow quick-dry enamel paint with the second highest lead content in 2013 at 126,000 ppm, registered a vast 99.77 percent reduction in lead content to 290 ppm in this study.
- **Reduction in lead content to below 90 ppm was found in some of the paints from 10 out of 24 paint brands analyzed in 2013.**

#### Consumer Information

- **Paint can labels contained insufficient information.** Product ingredients, including whether the product contained lead, were not fully disclosed; manufacturing and expiration dates were not explicitly displayed; and warning signs indicating that lead dust are hazardous to children and pregnant women were not specified. Labels indicating “lead-free,” “non-added lead,” and “zero lead” claims were not supported by independent, third-party certification declarations.
- **Lead concentrations below 90 ppm were found in 12 out of 15 paints which explicitly carried “lead-free,” “non-added lead,” and “zero lead” claims on their labels.** Three paints from one brand with “zero lead” claims on their labels contained lead concentrations ranging from 13,800 to 46,000 ppm.



## Total Lead Content Analysis

Overall, 140 cans of solvent-based enamel decorative paints from 44 brands were purchased in 11 cities in Metro Manila, Cebu and Pampanga in the Philippines and analyzed for their lead content. Results are given in parts per million (ppm) lead, based on dry weight of the paint. Please see Appendix A for full description of the results.

Paints shown to contain lead concentrations above 90 ppm in the 2013 study, as well as new brands and new colors from previously analyzed brands were given priority for this study. However, not all paint samples with lead concentrations above 90 ppm in the 2013 study were included as some were not on store shelves at the time of purchase or already phased out in the market.

A total of 97 enamel decorative paints were found to contain lead concentrations greater than 90 ppm (69 percent of paints), which may render young children and pregnant women at risk of lead poisoning. If exported, these paints will not be permitted for sale in most industrialized countries.

On the other hand, samples from 43 paints (31 percent of paints) contained lead concentrations below the 90 ppm regulatory standard limit, including 22 paints (16 percent of paints) containing less than 10 ppm concentrations of lead.

Dangerously high lead concentrations greater than 10,000 ppm were detected in 63 enamel decorative paints (45 percent of paints), and can be considered a major public health hazard and environmental concern.

A lemon yellow quick-dry enamel paint contained the highest total lead concentration of 153,000 ppm, while 22 enamel paints representing 11 brands contained lead concentrations below 10 ppm.

## Paint Brand Analysis

The ten enamel decorative paints with the highest amounts of lead are summarized in Table 1. The top two paints with the highest lead content—PLP-363 and PLP-353, which were also analyzed in 2013—ranked fourth and fifth amongst the highest lead-containing paints in the 2013 study, respectively.

**Table 1.** Top 10 Solvent-based Enamel Decorative Paints with the Highest Lead Content

Rank	Sample No.	Brand	Color	2013 Lead Content (ppm)	2015 Lead Content (ppm)
1	PLP-363	B-21	Lemon Yellow	104,000	<b>153,000</b>
2	PLP-353	B-17	Yellow	94,000	<b>104,000</b>
	PLP-395	B-32	Orange	N/A	<b>104,000</b>
4	PLP-328	B-09	Lemon Yellow	N/A	<b>102,000</b>
5	PLP-406	B-37	Lemon Yellow	49,000	<b>98,000</b>
6	PLP-330	B-10	Lemon Yellow	57,000	<b>96,000</b>
7	PLP-412	B-38	Moly Orange	33,000	<b>84,000</b>
8	PLP-407	B-37	California Orange	N/A	<b>82,000</b>
9	PLP-347	B-15	Yellow	33,000	<b>76,000</b>
10	PLP-365	B-21	Grasol Red	N/A	<b>72,000</b>

Lead concentrations above 90 ppm were detected in samples from at least one paint from 35 out of 44 analyzed paint brands (80 percent of paint brands). A paint from the brand B-21 contained the highest total lead concentration of 153,000 ppm.

Extremely high lead concentrations above 10,000 ppm were detected in samples from at least one paint from 27 paint brands (61 percent of paint brands). On the other hand, lead below 90 ppm was detected in paints from 21 paint brands (48 percent of paint brands), suggesting that these brands have the capability to produce paints with lead content below 90 ppm. However, nine of these 21 brands still had paints containing more than 10,000 ppm lead.

The distribution of the lead concentration by brand is summarized in Table 7 in Appendix A.

### ***Paint Brands Not Previously Analyzed***

Eighteen new paint brands, not previously analyzed, were included in this study. The distribution of the lead concentration is shown in Table 2.

**Table 2.** Distribution of Lead Concentration in Paints from Paint Brands Not Previously Studied

Brand	No. of Samples	No. of Samples Above 90 ppm	No. of Samples Above 600 ppm	No. of Samples Above 10,000 ppm	Minimum Lead Content (ppm)	Maximum Lead Content (ppm)
B-03	4	0	0	0	5	81
B-07	4	4	3	3	340	42,000
B-09	2 (yellow, orange)	2	2	2	38,000	102,000
B-14	4	1	1	1	5	45,000
B-16	1 (red)	1	1	0	8,000	8,000
B-18	1 (white)	1	0	0	96	96
B-20	2 (yellow, orange)	2	2	2	58,000	69,000
B-24	2 (yellow, orange)	2	2	2	29,000	69,000
B-25	4	0	0	0	<5	11
B-27	3	2	2	1	12	32,000
B-28	3	2	1	1	66	42,000
B-31	1 (white)	1	1	0	930	930
B-32	4	4	4	3	5,000	104,000
B-33	1 (white)	0	0	0	34	34
B-35	3	3	3	2	620	38,000
B-36	1 (white)	0	0	0	25	25
B-39	4	4	3	3	95	28,000
B-44	2 (yellow, orange)	2	2	2	31,000	58,000

Lead concentrations above 90 ppm were detected in samples of paint from 14 new paint brands, while lead concentrations greater than 10,000 ppm were detected in samples of paint from 11 new paint brands. Conversely, lead concentrations below 90 ppm were detected in at least one paint from seven brands not previously studied.

## Paint Color Analysis

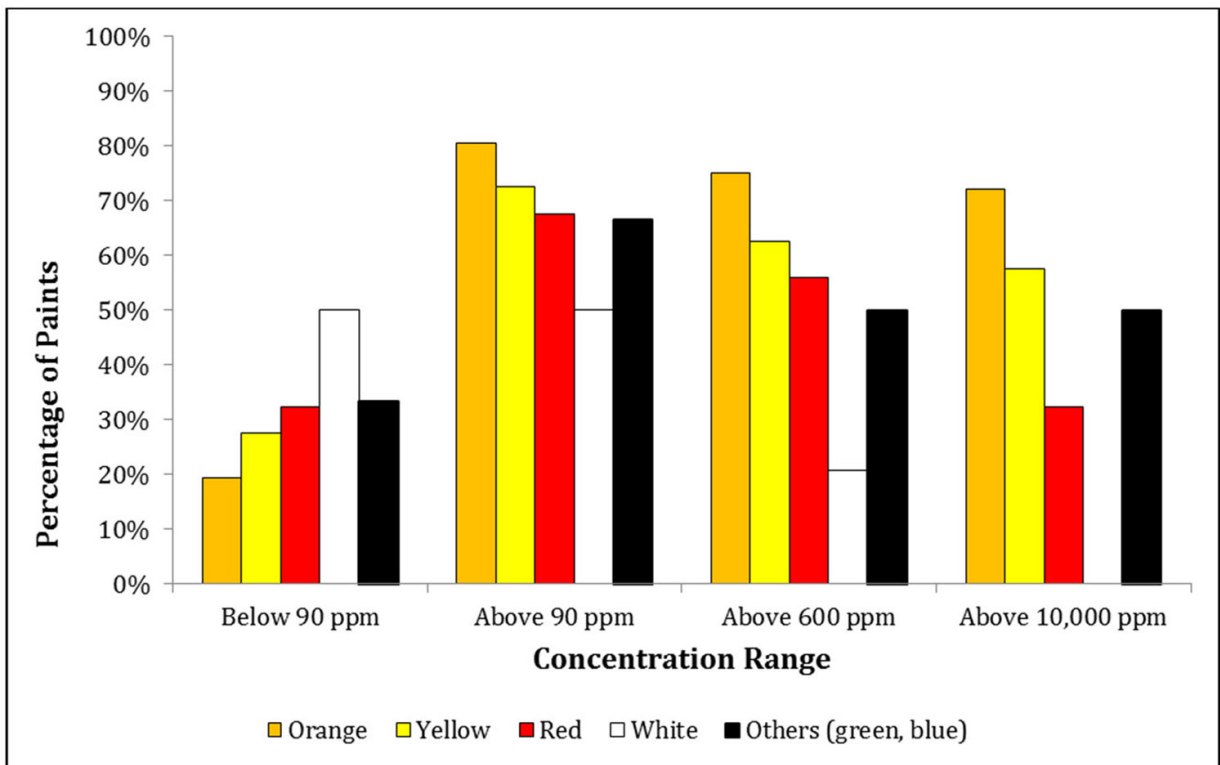
Among all the 140 analyzed household enamel paints were 40 yellow-colored paints, 36 orange paints, 34 red paints, 24 white paints, as well as a few other colors, including four green and two blue paints.

A lemon yellow-colored quick-dry enamel paint contained the highest total lead concentration of 153,000 ppm, or 1,700 times greater than the regulatory standard limit of 90 ppm.

A majority of bright-colored paints (85 out of 116 paints, or 73 percent of bright-colored paints), such as orange, red, yellow, green and blue contained lead concentrations greater than 90 ppm, 63 paints (54 percent of bright-colored paints) of which contained lead concentrations above 10,000 ppm. The distribution of the lead concentration by color is summarized in Table 7 in Appendix A.

Eighty-one percent of orange paints (29 out of 36 paints), 72 percent of yellow paints (29 out of 40 paints), and 68 percent of red paints (23 out of 34 paints) exceeded the 90 ppm regulatory standard.

Moreover, 72 percent of orange paints (26 out of 36 paints), 58 percent of yellow paints (23 out of 40 paints), and 32 percent of red paints (11 out of 34 paints) contained extremely high lead concentrations beyond 10,000 ppm as illustrated in Figure 2.



**Figure 2.** Distribution of Lead Concentrations in New Enamel Household Paints by Color.



## Labeling

As in the 2013 study, a majority of the sampled paints do not include sufficient information on their labels to aid consumers in distinguishing paints with lead-safe concentrations below 90 ppm. Only 22 cans out of 140 paint samples indicated the paints' lead content on their labels. The consumer information about lead on paint can labels is summarized in Table 9 in Appendix A.

Product ingredients, including whether the product contained lead, were not fully disclosed; manufacturing and expiration dates were not explicitly displayed; and warning signs indicating that lead dust are hazardous to children and pregnant women were not specified. Labels indicating "lead-free," "non-added lead," and "zero lead" claims were not supported by independent, third-party certification declarations.

Of the 140 paint samples, only 15 cans from five brands explicitly carried "lead-free," "non-added lead," and "zero lead" claims, of which only samples from 12 paints contained lead concentrations below 90 ppm.

Three paints from one brand contained lead concentrations ranging from 13,800 to 46,000 ppm despite the "zero lead" labeling.

## Comparative Analysis of the 2015 and 2013 Lead Paint Studies

The 2013 paint sampling study attempted to look at the whole Philippine paint market, including as many paint brands as possible. On the other hand, the 2015 study focused on paints specifically selected for their high lead content in the first study, as well as those paints that had not previously been analyzed for their total lead content. Paints shown to contain lead below 90 ppm in earlier studies were not included in this study. The comparison of results of analysis of both studies is summarized in Table 8 in Appendix A.

Reduction in lead content below 90 ppm was found in 13 out of 47 paints analyzed in 2013. In addition, samples from at least one paint from 19 out of 24 paint brands analyzed in 2013 had reduced lead content, of which 13 paints from 10 brands contained lead concentrations below 90 ppm. Table 3 shows ten paints with lead content reduction indicating paint reformulations in terms of exclusion of lead pigments and/or lead drying agents.

**Table 3.** Paints with Lead Content Reductions Indicating Paint Reformulations

Sample No.	Brand	Color	2013 Lead Content (ppm)	2015 Lead Content (ppm)
PLP-301	B-01	Lemon Yellow	126,000	290
PLP-379	B-26	Lemon Yellow	32,600	1,280
PLP-371	B-23	Sunshine Yellow	26,600	<10
PLP-368	B-22	Lemon Yellow	23,200	18
PLP-357	B-19	Yellow	17,700	300
PLP-372	B-23	Ivory	5,980	<5
PLP-323	B-08	Lemon Yellow	4,590	<5
PLP-350	B-15	Red	2,330	15
PLP-346	B-15	White	1,630	<5
PLP-327	B-08	Dark Green	1,540	296

## 4. Conclusions

Since the EcoWaste Coalition began studying the lead content of paints sold in the Philippines in 2008, most paint brands with the largest market share have shown a significant reduction in the amount of lead to less than 90 ppm. The top two brands in the country—Boysen and Davies—now sell paint that would meet the most stringent regulation anywhere in the world. This demonstrates that paint with low lead content can be produced cost-effectively in the Philippines, and that companies are willing and able to make the shift.

Additionally, since the EcoWaste Coalition began investigating lead in decorative paint, the effort to craft a regulation on lead did not move forward until the EcoWaste Coalition in 2011 drew the attention of consumers, policy makers and industry leaders to the issue through its successive studies on lead in paints and consumer products being sold in the local market. Responding to the demand for a regulatory policy, the EMB organized a series of stakeholders' meetings in 2011 and 2012 that eventually led to the completion of the CCO drafting process in the same year. In 2013, six years after the work began and after six revisions, the CCO was officially approved by DENR Secretary Ramon J.P. Paje. These actions demonstrate that government officials have become aware of the danger lead paint poses to young children and the nation's economy, and are willing to prevent childhood lead exposure.

Though the advocacy of the EcoWaste Coalition has raised awareness on the hazards of lead paint among consumers, it remains virtually impossible for consumers to identify which paints contain unacceptable levels of lead, since most companies do not provide information on their labels and those that do cannot be independently verified.

Nevertheless, paints with high lead levels, especially those manufactured by small- and medium-sized manufacturers representing ten percent of the paint market, remain available in many hardware shops and paint centers in the country. These producers often face special barriers in shifting to low lead products and may require additional technical information, better access to suppliers of non-lead paint ingredients, and other types of help in reformulating their products.

## 5. Recommendations

### Government and Government Agencies

- Strictly enforce the CCO for Lead and Lead Compounds towards the successful implementation of the prohibited uses of lead and the targeted phase-out of leaded decorative paints by 2016 and leaded industrial paints by 2019.
- Establish a multi-stakeholders' oversight committee to assist with the monitoring of compliance to the provisions and requirements of the CCO.
- Provide incentives to paint companies to swiftly transition from lead to non-lead paint production.
- Require paint can labels with sufficient information indicating the lead content and provide a warning on possible lead dust hazards when disturbing painted surfaces.
- Promote mandatory lead safe paint for government purchasing.
- Facilitate workers' training on lead-safe work practices when applying paint to previously painted surfaces to minimize dispersal of lead dust.
- For the Department of Education (DepEd), along with the Department of Environment and Natural Resources (DENR), the Department of Health (DOH) and public interest stakeholders, to embark on an investigative study on lead paint hazards in the public educational system.

### Paint Industry

- Support small- and medium-sized paint companies in their efforts to transition to non-lead paint production even before the targeted phase-out dates.
- Participate in the third-party "Lead Safe Paint Certification" program to help consumers differentiate paints that are compliant with the 90 ppm lead in paint regulatory standard and those that are not.
- 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.

### Consumers

- Ask for certified lead safe paints for healthier homes and patronize businesses that sell unleaded paints.
- Become aware of lead paint and dust hazards, and precautions to take to minimize them.



### **Public Health Organizations**

- 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.
- Promote efforts to make blood lead testing available.
- Encourage specification of “lead safe paints” on purchase orders of larger paint consumers such as schools, day-care centers and large housing property owners or managers.

### **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 “lead safe paint” procurement policies.
- Support a third-party certification and labelling program that will ensure all paints sold in the market meet the regulatory standard of 90 ppm and help customers in having an informed choice when buying paints.

## Appendix A

**Table 4.** Solvent-based Enamel Decorative Paints Included in the Study

Sample No.	Brand	Color	Volume (L)	Price (PhP)	Date of Manufacture (d/m/y)	Batch No. <sup>c</sup>	Date of Purchase (d/m/y)	Is there website on label?
PLP-300	B-01	White	1	140.00	N/A	14080830	28/10/14	Yes
PLP-301	B-01	Lemon Yellow	4	595.00	N/A	14082732	14/11/14	Yes
PLP-302	B-01	Moly Orange	4	650.00	N/A	14081232	29/10/14	Yes
PLP-303	B-01	International Red	4	530.00	N/A	14103033	14/11/14	Yes
PLP-304	B-02	Red	1	116.45	N/A	10140177	27/10/14	Yes
PLP-305	B-03	White	4	470.00	N/A	N/A	03/11/14	No
PLP-306	B-03	Lemon Yellow	4	480.00	N/A	N/A	31/10/14	No
PLP-307	B-03	Moly Orange	4	480.00	N/A	N/A	31/10/14	No
PLP-308	B-03	International Red	4	480.00	N/A	N/A	31/10/14	No
PLP-309	B-04	Yellow	4	580.00	N/A	14108468	29/10/14	No
PLP-310	B-04	Orange	4	490.00	N/A	13091271	04/11/14	No
PLP-311	B-04	International Red	4	580.00	N/A	14098583	30/10/14	No
PLP-312	B-05	Lemon Yellow	0.06	25.00	N/A	N/A	30/10/14	No
PLP-313	B-05	Orange	0.06	25.00	N/A	N/A	30/10/14	No
PLP-314	B-05	Red	0.06	25.00	N/A	N/A	30/10/14	No
PLP-315	B-06	Lemon Yellow	1	164.75	N/A	10260160	30/10/14	No
PLP-316	B-06	Caterpillar Yellow	1	149.75	N/A	10230312	30/10/14	No
PLP-317	B-06	Orange	0.25	70.00	N/A	10090297	04/11/14	No
PLP-318	B-06	International Red	1	146.25	N/A	1900856	02/11/14	No
PLP-319	B-07	White	4	430.00	N/A	10311401	13/11/14	No
PLP-320	B-07	Lemon Yellow	4	430.00	N/A	09201401	13/11/14	No
PLP-321	B-07	Moly Orange	4	460.00	N/A	09261401	13/11/14	No
PLP-322	B-07	International Red	4	430.00	N/A	10311401	13/11/14	No
PLP-323	B-08	Lemon Yellow	1	175.75	N/A	1940233	27/10/14	No
PLP-324	B-08	Caterpillar Yellow	1	159.75	N/A	10260270	30/10/14	No
PLP-325	B-08	Red Orange	1	233.95	N/A	10130493	02/11/14	No
PLP-326	B-08	International Red	1	174.75	N/A	10250072	30/10/14	No
PLP-327	B-08	Dark Green	4	526.65	N/A	1920038	02/11/14	No
PLP-328	B-09	Lemon Yellow	4	480.00	N/A	5162693	30/10/14	No
PLP-329	B-09	Orange	4	480.00	N/A	10281781	30/10/14	No
PLP-330	B-10	Lemon Yellow	4	480.00	N/A	9264646	28/10/14	No
PLP-331	B-10	Orange	4	450.00	N/A	7084183	30/10/14	No
PLP-332	B-10	International Red	4	460.00	N/A	2054400	29/10/14	No
PLP-334	B-11	Orange	1	260.00	N/A	12131742	08/11/14	Yes
PLP-335	B-11	International Red	1	180.00	N/A	05140889	08/11/14	Yes
PLP-336	B-11	Royal Blue	1	170.00	N/A	02120609	08/11/14	Yes
PLP-337	B-12	Orange	0.25	60.00	N/A	10100047	27/10/14	No
PLP-338	B-12	Lemon Yellow	0.25	60.00	N/A	10190169	27/10/14	No
PLP-339	B-13	Yellow	0.25	79.75	N/A	05091435	26/10/14	No
PLP-340	B-13	Orange	0.06	29.75	N/A	05101345	28/10/14	No
PLP-341	B-13	International Red	0.25	79.75	N/A	12151231	29/10/14	No
PLP-342	B-14	White	1	140.00	N/A	134006610	31/10/14	No
PLP-343	B-14	Lemon Yellow	0.25	75.00	N/A	14230227	27/10/14	No

c. Batch codes can sometimes be interpreted as dates of manufacture.

## Appendix A

Table 4. Solvent-based Enamel Decorative Paints Included in the Study (continued)

Sample No.	Brand	Color	Volume (L)	Price (Php)	Date of Manufacture (d/m/y)	Batch No. <sup>d</sup>	Date of Purchase (d/m/y)	Is there website on label?
PLP-344	B-14	Orange	1	230.00	N/A	14170730	27/10/14	No
PLP-345	B-14	International Red	0.25	80.00	N/A	14410122	04/11/14	No
PLP-346	B-15	White	0.25	56.00	N/A	14071104	15/11/14	No
PLP-347	B-15	Yellow	0.25	57.00	N/A	14100304	15/11/14	No
PLP-348	B-15	Orange	0.25	57.00	N/A	14090804	15/11/14	No
PLP-349	B-15	International Red	1	169.00	N/A	14091903	15/11/14	No
PLP-350	B-15	Red	1	124.00	N/A	14062104	15/11/14	No
PLP-351	B-16	Red	0.06	20.00	N/A	N/A	30/10/14	No
PLP-352	B-17	White	0.06	25.00	N/A	N/A	28/10/14	No
PLP-353	B-17	Yellow	0.06	25.00	N/A	N/A	28/10/14	No
PLP-354	B-17	Orange	0.06	25.00	N/A	N/A	28/10/14	No
PLP-355	B-17	Red	0.06	25.00	N/A	N/A	16/12/14	No
PLP-356	B-18	White	4	530.00	N/A	N/A	13/11/14	No
PLP-357	B-19	Yellow	0.25	60.00	N/A	N/A	28/10/14	No
PLP-358	B-19	Orange	0.25	60.00	N/A	N/A	28/10/14	No
PLP-359	B-19	International Red	0.25	60.00	N/A	N/A	28/10/14	No
PLP-360	B-20	Lemon Yellow	4	480.00	N/A	09251470	28/10/14	No
PLP-361	B-20	Moly Orange	4	490.00	N/A	N/A	28/10/14	No
PLP-362	B-21	White	0.25	60.00	N/A	13.0425	27/10/14	Yes
PLP-363	B-21	Lemon Yellow	0.25	60.00	N/A	13.0804	27/10/14	Yes
PLP-364	B-21	Orange	0.08	50.00	N/A	N/A	29/10/14	No
PLP-365	B-21	Grasol Red	0.25	54.00	N/A	13.0457	29/10/14	Yes
PLP-366	B-21	Emerald Green	0.25	60.00	N/A	13.0871	27/10/14	Yes
PLP-367	B-22	White	4	470.00	N/A	07140981	30/10/14	No
PLP-368	B-22	Lemon Yellow	4	470.00	N/A	08140041	28/10/14	No
PLP-369	B-22	Orange	4	490.00	N/A	09140981	31/10/14	No
PLP-370	B-22	International Red	4	470.00	N/A	08141171	30/10/14	No
PLP-371	B-23	Sunshine Yellow	1	160.00	N/A	08112204	29/10/14	Yes
PLP-372	B-23	Ivory	1	157.65	N/A	10101509	29/10/14	Yes
PLP-373	B-24	Lemon Yellow	4	490.00	N/A	19459	29/10/14	No
PLP-374	B-24	Moly Orange	4	490.00	N/A	19531	29/10/14	No
PLP-375	B-25	White	1	372.00	N/A	1203056176	12/11/14	Yes
PLP-376	B-25	Lemon Yellow	1	392.00	N/A	N/A	12/11/14	Yes
PLP-377	B-25	Coronette Orange	1	436.00	N/A	N/A	12/11/14	Yes
PLP-378	B-25	Knockout Red	1	456.00	N/A	N/A	12/11/14	Yes
PLP-379	B-26	Lemon Yellow	0.25	55.00	N/A	14140303	27/10/14	Yes
PLP-380	B-26	Orange	0.25	55.00	N/A	14340207	27/10/14	Yes
PLP-381	B-26	Mandarin Red	1	140.00	N/A	12211022	03/11/14	No
PLP-382	B-27	White	0.25	50.00	N/A	N/A	22/11/14	No
PLP-383	B-27	Lemon Yellow	0.25	50.00	N/A	N/A	22/11/14	No
PLP-384	B-27	Bright Red	0.25	50.00	N/A	N/A	22/11/14	No
PLP-385	B-28	White	0.06	24.50	N/A	N/A	15/11/14	No
PLP-386	B-28	Green	0.06	24.50	N/A	N/A	15/11/14	No

d. Batch codes can sometimes be interpreted as dates of manufacture.



## Appendix A

Table 4. Solvent-based Enamel Decorative Paints Included in the Study (continued)

Sample No.	Brand	Color	Volume (L)	Price (PhP)	Date of Manufacture (d/m/y)	Batch No. <sup>e</sup>	Date of Purchase (d/m/y)	Is there website on label?
PLP-387	B-28	Blue	0.06	24.50	N/A	N/A	15/11/14	No
PLP-388	B-29	Lemon Yellow	4	520.00	N/A	14091814	28/10/14	No
PLP-389	B-29	Moly Orange	4	520.00	N/A	13112212	28/10/14	No
PLP-390	B-30	Lemon Yellow	4	520.00	N/A	1409252727	27/10/14	Yes
PLP-391	B-30	Moly Orange	4	520.00	N/A	1408042161	29/10/14	Yes
PLP-392	B-31	White	4	410.00	N/A	N/A	04/11/14	No
PLP-393	B-32	White	4	563.00	N/A	0114514	19/11/14	No
PLP-394	B-32	Caterpillar Yellow	4	535.00	N/A	1212292	19/11/14	No
PLP-395	B-32	Orange	4	736.00	N/A	0512400	19/11/14	No
PLP-396	B-32	International Red	4	586.00	N/A	0313277	19/11/14	No
PLP-397	B-33	White	4	463.00	N/A	07141161	04/11/14	No
PLP-398	B-34	White	0.25	55.00	N/A	95001058	28/10/14	No
PLP-399	B-34	Orange	0.25	65.00	N/A	95004950	28/10/14	No
PLP-400	B-34	Lemon Yellow	0.25	55.00	N/A	95002127	28/10/14	No
PLP-401	B-34	Red	1	140.00	N/A	96006536	04/11/14	No
PLP-402	B-35	White	4	585.00	N/A	09201401	13/11/14	No
PLP-403	B-35	Lemon Yellow	4	555.00	N/A	06190701	13/11/14	No
PLP-404	B-35	International Red	4	590.00	N/A	05301201	13/11/14	No
PLP-405	B-36	White	1	165.00	N/A	08061454	04/11/14	No
PLP-406	B-37	Lemon Yellow	1	244.75	N/A	N/A	02/11/14	No
PLP-407	B-37	California Orange	1	349.75	N/A	N/A	02/11/14	No
PLP-408	B-37	International Red	4	570.00	N/A	N/A	04/11/14	No
PLP-409	B-37	White	1	229.75	N/A	N/A	02/11/14	No
PLP-410	B-38	Lemon Yellow	0.08	25.00	N/A	N/A	29/10/14	No
PLP-411	B-38	International Red	0.08	25.00	N/A	N/A	29/10/14	No
PLP-412	B-38	Moly Orange	0.08	25.00	N/A	N/A	29/10/14	No
PLP-413	B-39	White	1	205.00	N/A	0114022	19/11/14	Yes
PLP-414	B-39	Lemon Yellow	1	165.00	N/A	1113205	19/11/14	Yes
PLP-415	B-39	Orange	4	655.00	N/A	0511069	19/11/14	Yes
PLP-416	B-39	International Red	1	180.00	N/A	0114087	19/11/14	Yes
PLP-417	B-40	Lemon Yellow	4	480.00	N/A	2720414	28/10/14	No
PLP-418	B-40	Caterpillar Yellow	4	550.00	N/A	1030714	29/10/14	No
PLP-419	B-40	Orange	4	480.00	N/A	1960214	29/10/14	No
PLP-420	B-40	International Red	4	480.00	N/A	2730914	29/10/14	No
PLP-421	B-41	White	0.25	60.00	N/A	96000878	28/10/14	No
PLP-422	B-41	Lemon Yellow	0.25	65.00	N/A	94002556	28/10/14	No
PLP-423	B-41	Orange	0.25	75.00	N/A	96000580	28/10/14	No
PLP-424	B-41	California Orange	0.25	50.00	N/A	95002906	30/10/14	No
PLP-425	B-41	International Red	0.25	50.00	N/A	95006876	30/10/14	No
PLP-426	B-41	Nile Green	0.25	55.00	N/A	94004461	28/10/14	No
PLP-427	B-41	Hansa Yellow	0.08	35.00	N/A	96000779	28/10/14	No
PLP-428	B-41	Orange	0.08	90.00	N/A	43009165	28/10/14	No
PLP-429	B-41	Red	0.25	65.00	N/A	96006979	28/10/14	No
PLP-430	B-42	White	4	439.99	N/A	1407122083	02/11/14	Yes

e. Batch codes can sometimes be interpreted as dates of manufacture.

## Appendix A

Table 4. Solvent-based Enamel Decorative Paints Included in the Study (continued)

Sample No.	Brand	Color	Volume (L)	Price (PhP)	Date of Manufacture (d/m/y)	Batch No. <sup>f</sup>	Date of Purchase (d/m/y)	Is there website on label?
PLP-431	B-42	Lemon Yellow	4	540.00	N/A	1406091440	07/11/14	Yes
PLP-432	B-42	Moly Orange	4	540.00	N/A	1406101439	07/11/14	Yes
PLP-433	B-42	International Red	4	490.00	N/A	1406261569	31/10/14	Yes
PLP-434	B-43	White	0.25	60.00	N/A	3140714	27/10/14	No
PLP-435	B-43	Lemon Yellow	0.25	57.00	N/A	N/A	26/10/14	No
PLP-436	B-43	California Orange	1	210.00	N/A	8130714	28/10/14	No
PLP-437	B-43	International Red	1	142.00	N/A	2330814	29/10/14	No
PLP-438	B-43	Red	0.25	60.00	N/A	8320314	27/10/14	No
PLP-439	B-44	Caterpillar Yellow	4	480.00	N/A	0314117	27/11/14	No
PLP-440	B-44	Orange	4	480.00	N/A	1114041	27/11/14	No

f. Batch codes can sometimes be interpreted as dates of manufacture.

Table 5. Results of Laboratory Analysis of Solvent-based Enamel Decorative Paints

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?
PLP-300	B-01	White	<5	Philippines	Philippines	No
PLP-301	B-01	Lemon Yellow	290	Philippines	Philippines	No
PLP-302	B-01	Moly Orange	2,900	Philippines	Philippines	No
PLP-303	B-01	International Red	28	Philippines	Philippines	No
PLP-304	B-02	Red	49	Philippines	Philippines	No
PLP-305	B-03	White	5	Philippines	Philippines	No
PLP-306	B-03	Lemon Yellow	34	Philippines	Philippines	No
PLP-307	B-03	Moly Orange	81	Philippines	Philippines	No
PLP-308	B-03	International Red	46	Philippines	Philippines	No
PLP-309	B-04	Yellow	42	Philippines	Philippines	No
PLP-310	B-04	Orange	60,000	Philippines	Philippines	No
PLP-311	B-04	International Red	145	Philippines	Philippines	No
PLP-312	B-05	Lemon Yellow	36,000	Philippines	Philippines	No
PLP-313	B-05	Orange	41,000	Philippines	Philippines	No
PLP-314	B-05	Red	360	Philippines	Philippines	No
PLP-315	B-06	Lemon Yellow	<10	Philippines	Philippines	No
PLP-316	B-06	Caterpillar Yellow	95	Philippines	Philippines	No
PLP-317	B-06	Orange	48	Philippines	Philippines	No
PLP-318	B-06	International Red	314	Philippines	Philippines	No
PLP-319	B-07	White	340	Philippines	Philippines	No
PLP-320	B-07	Lemon Yellow	42,000	Philippines	Philippines	No
PLP-321	B-07	Moly Orange	24,000	Philippines	Philippines	No
PLP-322	B-07	International Red	12,000	Philippines	Philippines	No

## Appendix A

Table 5. Results of Laboratory Analysis of Solvent-based Enamel Decorative Paints (continued)

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?
PLP-323	B-08	Lemon Yellow	<5	Philippines	Philippines	No
PLP-324	B-08	Caterpillar Yellow	<10	Philippines	Philippines	No
PLP-325	B-08	Red Orange	<5	Philippines	Philippines	No
PLP-326	B-08	International Red	<5	Philippines	Philippines	No
PLP-327	B-08	Dark Green	296	Philippines	Philippines	No
PLP-328	B-09	Lemon Yellow	102,000	Philippines	Philippines	No
PLP-329	B-09	Orange	38,000	Philippines	Philippines	No
PLP-330	B-10	Lemon Yellow	96,000	Philippines	Philippines	No
PLP-331	B-10	Orange	36,000	Philippines	Philippines	No
PLP-332	B-10	International Red	28	Philippines	Philippines	No
PLP-334	B-11	Orange	<5	Philippines	Philippines	Yes
PLP-335	B-11	International Red	<5	Philippines	Philippines	Yes
PLP-336	B-11	Royal Blue	<5	Philippines	Philippines	Yes
PLP-337	B-12	Orange	<5	Philippines	Philippines	No
PLP-338	B-12	Lemon Yellow	<5	Philippines	Philippines	No
PLP-339	B-13	Yellow	48,000	Philippines	Philippines	Yes
PLP-340	B-13	Orange	46,000	Philippines	Philippines	Yes
PLP-341	B-13	International Red	11,600	Philippines	Philippines	Yes
PLP-342	B-14	White	5	Philippines	Philippines	No
PLP-343	B-14	Lemon Yellow	5	Philippines	Philippines	No
PLP-344	B-14	Orange	45,000	Philippines	Philippines	No
PLP-345	B-14	International Red	6	Philippines	Philippines	No
PLP-346	B-15	White	<5	Philippines	Philippines	No
PLP-347	B-15	Yellow	76,000	Philippines	Philippines	No
PLP-348	B-15	Orange	39,000	Philippines	Philippines	No
PLP-349	B-15	International Red	1,740	Philippines	Philippines	No
PLP-350	B-15	Red	15	Philippines	Philippines	No
PLP-351	B-16	Red	8,000	Philippines	Philippines	No
PLP-352	B-17	White	401	Philippines	Philippines	No
PLP-353	B-17	Yellow	104,000	Philippines	Philippines	No
PLP-354	B-17	Orange	40,000	Philippines	Philippines	No
PLP-355	B-17	Red	38,000	Philippines	Philippines	No
PLP-356	B-18	White	96	Philippines	Philippines	No
PLP-357	B-19	Yellow	300	Philippines	Philippines	No
PLP-358	B-19	Orange	145	Philippines	Philippines	No
PLP-359	B-19	International Red	184	Philippines	Philippines	No
PLP-360	B-20	Lemon Yellow	69,000	Philippines	Philippines	No
PLP-361	B-20	Moly Orange	58,000	Philippines	Philippines	No
PLP-362	B-21	White	77	Philippines	Philippines	No
PLP-363	B-21	Lemon Yellow	153,000	Philippines	Philippines	No
PLP-364	B-21	Orange	39,000	Philippines	Philippines	Yes
PLP-365	B-21	Grasol Red	72,000	Philippines	Philippines	No
PLP-366	B-21	Emerald Green	49,000	Philippines	Philippines	No
PLP-367	B-22	White	46	Philippines	Philippines	Yes



## Appendix A

Table 5. Results of Laboratory Analysis of Solvent-based Enamel Decorative Paints (continued)

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?
PLP-368	B-22	Lemon Yellow	18	Philippines	Philippines	Yes
PLP-369	B-22	Orange	70	Philippines	Philippines	Yes
PLP-370	B-22	International Red	9	Philippines	Philippines	Yes
PLP-371	B-23	Sunshine Yellow	<10	Philippines	Philippines	No
PLP-372	B-23	Ivory	<5	Philippines	Philippines	No
PLP-373	B-24	Lemon Yellow	69,000	Philippines	Philippines	Yes
PLP-374	B-24	Moly Orange	29,000	Philippines	Philippines	Yes
PLP-375	B-25	White	11	Japan	Malaysia	Yes
PLP-376	B-25	Lemon Yellow	<5	Japan	Malaysia	Yes
PLP-377	B-25	Coronette Orange	<5	Japan	Malaysia	Yes
PLP-378	B-25	Knockout Red	<5	Japan	Malaysia	Yes
PLP-379	B-26	Lemon Yellow	1,280	Philippines	Philippines	No
PLP-380	B-26	Orange	26,000	Philippines	Philippines	No
PLP-381	B-26	Mandarin Red	2,900	Philippines	Philippines	No
PLP-382	B-27	White	12	Philippines	Philippines	No
PLP-383	B-27	Lemon Yellow	32,000	Philippines	Philippines	No
PLP-384	B-27	Bright Red	2,900	Philippines	Philippines	No
PLP-385	B-28	White	127	Philippines	Philippines	No
PLP-386	B-28	Green	42,000	Philippines	Philippines	No
PLP-387	B-28	Blue	66	Philippines	Philippines	No
PLP-388	B-29	Lemon Yellow	32,000	Philippines	Philippines	No
PLP-389	B-29	Moly Orange	29,000	Philippines	Philippines	No
PLP-390	B-30	Lemon Yellow	24,000	Philippines	Philippines	No
PLP-391	B-30	Moly Orange	17,000	Philippines	Philippines	No
PLP-392	B-31	White	930	Philippines	Philippines	No
PLP-393	B-32	White	5,000	Philippines	Philippines	No
PLP-394	B-32	Caterpillar Yellow	62,000	Philippines	Philippines	No
PLP-395	B-32	Orange	104,000	Philippines	Philippines	No
PLP-396	B-32	International Red	32,000	Philippines	Philippines	No
PLP-397	B-33	White	34	Philippines	Philippines	Yes
PLP-398	B-34	White	630	Philippines	Philippines	No
PLP-399	B-34	Orange	58,000	Philippines	Philippines	No
PLP-400	B-34	Lemon Yellow	42,000	Philippines	Philippines	No
PLP-401	B-34	Red	39,000	Philippines	Philippines	No
PLP-402	B-35	White	620	Philippines	Philippines	No
PLP-403	B-35	Lemon Yellow	38,000	Philippines	Philippines	No
PLP-404	B-35	International Red	18,600	Philippines	Philippines	No
PLP-405	B-36	White	25	Philippines	Philippines	No
PLP-406	B-37	Lemon Yellow	98,000	Philippines	Philippines	No
PLP-407	B-37	California Orange	82,000	Philippines	Philippines	No
PLP-408	B-37	International Red	3,100	Philippines	Philippines	No
PLP-409	B-37	White	134	Philippines	Philippines	No
PLP-410	B-38	Lemon Yellow	43,000	Philippines	Philippines	No
PLP-411	B-38	International Red	8,300	Philippines	Philippines	No

## Appendix A

Table 5. Results of Laboratory Analysis of Solvent-based Enamel Decorative Paints (continued)

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?
PLP-412	B-38	Moly Orange	84,000	Philippines	Philippines	No
PLP-413	B-39	White	95	Philippines	Philippines	No
PLP-414	B-39	Lemon Yellow	28,000	Philippines	Philippines	No
PLP-415	B-39	Orange	12,600	Philippines	Philippines	No
PLP-416	B-39	International Red	25,000	Philippines	Philippines	No
PLP-417	B-40	Lemon Yellow	480	Philippines	Philippines	No
PLP-418	B-40	Caterpillar Yellow	1,020	Philippines	Philippines	No
PLP-419	B-40	Orange	210	Philippines	Philippines	No
PLP-420	B-40	International Red	2,300	Philippines	Philippines	No
PLP-421	B-41	White	313	Philippines	Philippines	No
PLP-422	B-41	Lemon Yellow	51,000	Philippines	Philippines	No
PLP-423	B-41	Orange	45,000	Philippines	Philippines	No
PLP-424	B-41	California Orange	44,000	Philippines	Philippines	No
PLP-425	B-41	International Red	59,000	Philippines	Philippines	No
PLP-426	B-41	Nile Green	22,000	Philippines	Philippines	No
PLP-427	B-41	Hansa Yellow	29	Philippines	Philippines	No
PLP-428	B-41	Orange	67,000	Philippines	Philippines	No
PLP-429	B-41	Red	89	Philippines	Philippines	No
PLP-430	B-42	White	80	Philippines	Philippines	Yes
PLP-431	B-42	Lemon Yellow	25,000	Philippines	Philippines	Yes
PLP-432	B-42	Moly Orange	46,000	Philippines	Philippines	Yes
PLP-433	B-42	International Red	13,800	Philippines	Philippines	Yes
PLP-434	B-43	White	2,640	Philippines	Philippines	No
PLP-435	B-43	Lemon Yellow	51,000	Philippines	Philippines	No
PLP-436	B-43	California Orange	48,000	Philippines	Philippines	No
PLP-437	B-43	International Red	25,000	Philippines	Philippines	No
PLP-438	B-43	Red	1,570	Philippines	Philippines	No
PLP-439	B-44	Caterpillar Yellow	31,000	Philippines	Philippines	No
PLP-440	B-44	Orange	58,000	Philippines	Philippines	No

Appendix A

**Table 6.** Distribution of Lead Concentration by Brand

Brand	No. of Samples	No. of Samples Above 90 ppm	No. of Samples Above 600 ppm	No. of Samples Above 10,000 ppm	Minimum Lead Content (ppm)	Maximum Lead Content (ppm)
B-01	4	2	1	0	<5	2,900
B-02	1 (red)	0	0	0	49	49
B-03	4	0	0	0	5	81
B-04	3	2	1	1	42	60,000
B-05	3	3	2	2	360	41,000
B-06	4	2	0	0	<10	314
B-07	4	4	3	3	340	42,000
B-08	5	1	0	0	<5	296
B-09	2 (yellow, orange)	2	2	2	38,000	102,000
B-10	3	2	2	2	28	96,000
B-11	3	0	0	0	<5	<5
B-12	2 (yellow, orange)	0	0	0	<5	<5
B-13	3	3	3	3	11,600	48,000
B-14	4	1	1	1	5	45,000
B-15	5	3	3	2	<5	76,000
B-16	1 (red)	1	1	0	8,000	8,000
B-17	4	4	3	3	401	104,000
B-18	1 (white)	1	0	0	96	96
B-19	3	3	0	0	145	300
B-20	2 (yellow, orange)	2	2	2	58,000	69,000
B-21	5	4	4	4	77	153,000
B-22	4	0	0	0	9	70
B-23	2 (yellow, ivory)	0	0	0	<5	<10
B-24	2 (yellow, orange)	2	2	2	29,000	69,000
B-25	4	0	0	0	<5	11
B-26	3	3	3	1	1,280	26,000
B-27	3	2	2	1	12	32,000
B-28	3	2	1	1	66	42,000
B-29	2 (yellow, orange)	2	2	2	29,000	32,000
B-30	2 (yellow, orange)	2	2	2	17,000	24,000
B-31	1 (white)	1	1	0	930	930
B-32	4	4	4	3	5,000	104,000
B-33	1 (white)	0	0	0	34	34
B-34	4	4	3	3	630	58,000
B-35	3	3	3	2	620	38,000
B-36	1 (white)	0	0	0	25	25
B-37	4	4	3	2	134	98,000
B-38	3	3	3	2	8,300	84,000
B-39	4	4	3	3	95	28,000
B-40	4	4	2	0	210	2,300
B-41	9	7	6	6	29	67,000
B-42	4	3	3	3	80	46,000
B-43	5	5	5	3	1,570	51,000
B-44	2 (yellow, orange)	2	2	2	31,000	58,000



Appendix A

**Table 7.** Distribution of Lead Concentration by Color

Color	No. of Samples	No. of Samples Above 90 ppm	No. of Samples Above 600 ppm	No. of Samples Above 10,000 ppm	Minimum Lead Content (ppm)	Maximum Lead Content (ppm)
Blue	2	0	0	0	<5	66
Green	4	4	3	3	296	49,000
Orange	36	29	27	26	<5	104,000
Red	34	23	19	11	<5	72,000
White	24	12	5	0	<5	5,000
Yellow	40	29	25	23	<5	153,000

**Table 8.** Comparison of Results of Lead Analysis from the First Study in 2013

Brand	No. of Samples		No. of Samples Above 90 ppm		No. of Samples Above 600 ppm		No. of Samples Above 10,000 ppm		Minimum Lead Content (ppm)		Maximum Lead Content (ppm)	
	'13	'15	2013	2015	2013	2015	2013	2015	2013	2015	2013	2015
B-01	2	4	2	2	1	1	1	0	380	<5	126,000	2,900
B-02	9	1	1	0	0	0	0	0	<8	49	113	49
B-04	2	3	1	2	1	1	0	1	28	42	720	60,000
B-05	4	3	2	3	2	2	2	2	17	360	40,000	41,000
B-06	3	4	0	2	0	0	0	0	19	<10	55	314
B-08	6	5	2	1	2	0	0	0	19	<5	4,600	296
B-10	2	3	1	2	1	2	1	2	75	28	57,000	96,000
B-11	7	3	3	0	1	0	1	0	<8	<5	11,000	<5
B-12	1	2	0	0	0	0	0	0	60	<5	60	<5
B-13	5	3	4	3	4	3	4	3	13	11,600	77,000	48,000
B-15	9	5	9	3	7	3	3	2	230	<5	39,000	76,000
B-17	4	4	4	4	4	3	3	3	740	401	94,000	104,000
B-19	5	3	2	3	1	0	1	0	25	145	18,000	300
B-21	6	5	6	4	5	4	5	4	169	77	114,000	153,000
B-22	1	4	1	0	1	0	1	0	23,000	9	23,000	70
B-23	4	2	3	0	3	0	2	0	42	<5	29,000	<10
B-26	7	3	4	3	4	3	4	1	13	1,280	32,000	26,000
B-29	2	2	2	2	2	2	2	2	17,500	29,000	27,000	32,000
B-30	1	2	1	2	1	2	1	2	21,000	17,000	21,000	24,000
B-34	4	4	4	4	4	3	3	3	950	630	84,000	58,000
B-37	4	4	1	4	1	3	1	2	24	134	49,000	98,000
B-38	4	3	3	3	3	3	3	2	12	8,300	49,000	84,000
B-40	1	4	1	4	0	2	0	0	186	210	186	2,300
B-41	8	9	8	7	6	6	5	6	135	29	156,000	67,000
B-42	1	4	1	3	1	3	1	3	34,000	80	34,000	46,000
B-43	7	5	7	5	7	5	4	3	3,500	1,570	24,000	51,000

Appendix A

**Table 9.** Consumer Information about Lead on Paint Cans

Brand	Number of Samples	Lead content or other lead information on the label (yes/no)	Independent, third party certification of “lead safe” claims? (yes/no)	Information about lead hazard to children (yes/no)	Information about lead hazard when painting or remodeling (yes/no)	Specific language about lead on label
B-01	4	No	No	No	No	No
B-02	1	No	No	No	No	No
B-03	4	No	No	No	No	No
B-04	3	No	No	No	No	No
B-05	3	No	No	No	No	No
B-06	4	No	No	No	No	No
B-07	4	No	No	No	No	No
B-08	5	No	No	No	No	No
B-09	2	No	No	No	No	No
B-10	3	No	No	No	No	No
B-11	3	Yes	No	No	No	Lead Free
B-12	2	No	No	No	No	No
B-13	3	Yes	No	No	No	Lead Content
B-14	4	No	No	No	No	No
B-15	5	No	No	No	No	No
B-16	1	No	No	No	No	No
B-17	4	No	No	No	No	No
B-18	1	No	No	No	No	No
B-19	3	No	No	No	No	No
B-20	2	No	No	No	No	No
B-21	5	Yes <sup>5</sup>	No	No	No	Lead Content
B-22	4	Yes	No	No	No	Lead-Free
B-23	2	No	No	No	No	No
B-24	2	Yes	No	No	No	Lead Content
B-25	4	Yes	No	No	No	Non-added Lead
B-26	3	No	No	No	No	No
B-27	3	No	No	No	No	No
B-28	3	No	No	No	No	No
B-29	2	No	No	No	No	No
B-30	2	No	No	No	No	No
B-31	1	No	No	No	No	No
B-32	4	No	No	No	No	No
B-33	1	Yes	No	No	No	Lead-Free
B-34	4	No	No	No	No	No
B-35	3	No	No	No	No	No
B-36	1	No	No	No	No	No
B-37	4	No	No	No	No	No
B-38	3	No	No	No	No	No
B-39	4	No	No	No	No	No
B-40	4	No	No	No	No	No
B-41	9	No	No	No	No	No
B-42	4	Yes	No	No	No	Zero Lead
B-43	5	No	No	No	No	No
B-44	2	No	No	No	No	No

## Appendix B

### Responses from Paint Manufacturers

#### 1. Andalusia Manufacturing Corporation



### **ANDALUCIA MANUFACTURING CORPORATION**

No. 18 (12 old) M. Gregorio Street, Canumay, Valenzuela City, Philippines

Tel. Nos. 292-4059 / 61, 292-4277, 456-8482, 445-8482 • Fax No. 292-4064

Mobile Nos. 0917-8247685 / 0922-8383584

May 30, 2015

Mr. Manny C. Calonzo  
Co-Chair, IPEN  
Regional Specialist,  
IPEN Lead Paint Elimination Project-Asia  
manny@ipen.org

and

Ms. Sonia Mendoza  
President, EcoWaste Coalition  
indo@ecowastecoalition.org

Dear Mr. Calonzo and Ms. Mendoza,

Greetings!

Our company, Andalusia Manufacturing Corp., has been in the paint manufacturing industry since 1974. We offer different paint types that cater to different application, under different brands, to suit our customer's needs. Our enamel products are under the brand names Seabird and Dallas.

Though not a member of Philippine Association of Paint Manufacturers (PAPM), our company is aware of the organization's vision of eliminating lead-added paints in the market.

During the first quarter of 2015, we learned that by January 2017, all architectural paints in the market must be lead-free. We have started to comply with this campaign by purchasing Zirconium Octoate Drier as replacement for lead drier in Alkyd paints. Once our stock of lead driers are consumed, we will start production of paints with the said lead-free drier.

We have also started inquiring about lead-free pigments (yellow, orange, red, blue, green) from our suppliers. Just like the lead drier, once our stock of these pigments is depleted, we shall immediately start production of paints with lead-free pigment.

Our company is thankful for organizations like yours. Rest assured, we will do our part to support you in your advocacy. Please feel free to contact us and we would gladly assist you.

Thank you very much.

Sincerely,

Ma. Corazon B. Ramirez  
Chemist

Noted by:

Jose C. Que Pua Jr.  
Assistant General Manager



2. FH Colors and Coatings Corporation



**FH COLORS & COATINGS CORP.**

B3L6 Greenway Business Park, Governor Drive, Bulihan, Silang, Cavite 4118 Philippines  
Tels: (02)8512688; (046)9720808 Fax: (02)8515088; (046)9721818 E-mail: sales@apluspaints.com.ph  
Visit us at <http://www.apluspaints.com.ph>

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June 10, 2015

Ms. Sonia Mendoza  
President  
EcoWaste Coalition

Cc: Mr. Manny C. Calonzo  
Co-Chair  
IPEN

Greetings!

This is to convey that FH Colors & Coatings Corp. fully supports the Philippine Government's initiative to phase out the use of lead compounds in paints through the DENR's CCO for lead and lead compounds.

Fully aware of the harmful effects of lead, the company has already started its lead phase-out program well before the signing of the CCO last December 2013. The company started it with the phase out of the Enamel Red Lead Primer followed by the phase-out of the lead-based drying catalyst for alkyd enamel paints. The last phase is the replacement of lead-based pigments with safe substitutes. Right now, the company is satisfied with the progress of its program and is confident that its products will have lead levels lower than the limit set by the CCO before the 2016 deadline for decorative paints and 2019 for industrial paints.

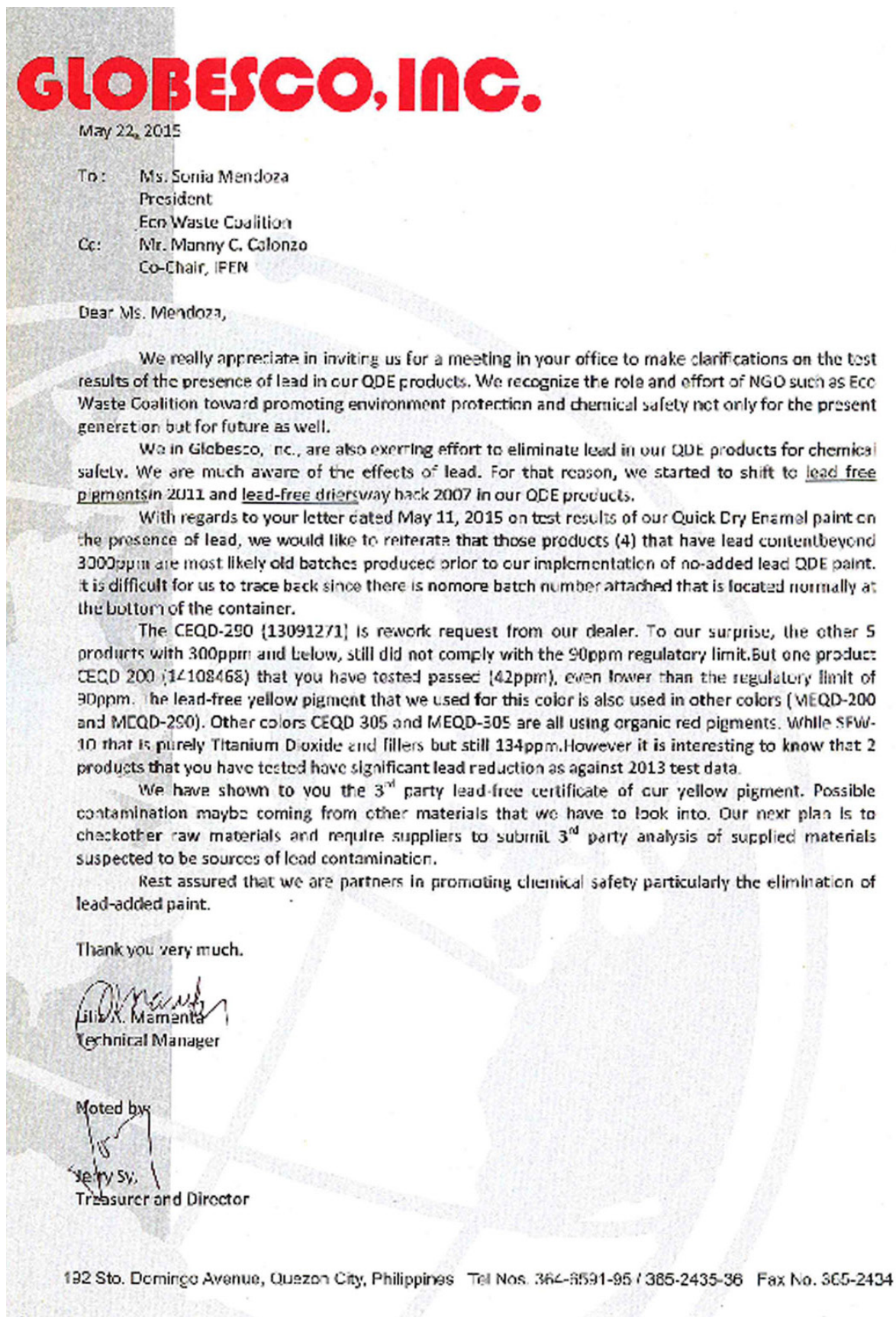
Rest assured that we will follow the CCO on lead and lead-based compounds set by DENR.

Sincerely,

A handwritten signature in black ink, appearing to read "Gemmar Gibe".

Mr. Gemmar Gibe  
VP-Business Development

3. Globesco, Inc.





4. H-Chem Industries, Inc. (Universal Paint and Coatings Philippines, Inc.)

**H-CHEM**  
INDUSTRIES INC.

S- ADMIN -0337-2015

**Ms. SONIA MENDOZA**

**President**

Unit 329, Eagle Court, 26 Matalino St.,  
1101 Quezon City, Philippines

**Dear Ms. Mendoza :**

**Subject: Laboratory results for Lead content of Universal Plus and Popular Enamel Paints**

Greetings!

We extend our appreciation for informing us of the results of the evaluation of UNIVERSAL PLUS and Popular Enamel Paints.

The company is committed to comply with the requirements stipulated in the Chemical Control Order (CCO) for Lead and Lead Compounds promulgated in pursuant of RA 6969, otherwise known as Toxic Substances and Hazardous and Nuclear Waste Act of 1990.

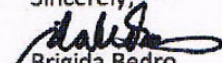
The company is committed to abide with the mandate of totally eliminating lead paints by 2016. We had already replaced lead driers with other non-lead containing raw materials since year 2014. We are currently evaluating several lead- free pigments as possible replacement for the existing lead pigments (particularly yellow and orange pigments).

These raw materials shall be considered as a replacement based on the initial evaluation. There are deviations in colors and other properties but these are minor considerations in comparison with the benefits of using lead –free pigments.

The initial batch of reformulated Universal Plus and Popular Enamel Paints will be ready for submission to an accredited testing center for the voluntary Lead Safe Certification Program by November 2015 and will continue until the complete line up is finished by the end of November 2015. Colors not conforming shall not be released by the company for sale.

Again, we are reiterating the commitment of the company to comply with the mandate of DENR as a responsible manufacturer of paint products.

Sincerely,

  
Brigida Bedro  
Technical Head

H-CHEM INDUSTRIES INC. • UNIVERSAL PAINT & COATINGS PHILIPPINES INC.  
53 F. Pasco Avenue, Barangay Santolan, Pasig City, Metro Manila 1600  
t (632) 646-8801 • (632) 646-8701 f (632) 646-8329 m +63917-5013352 e [info@universalpaint.net](mailto:info@universalpaint.net)  
[www.universalpaint.net](http://www.universalpaint.net) V.1014



5. Super Globe, Inc.



***SUPER GLOBE, INC.***

No. 8 Luis St., Brgy. San Miguel, Pasig City  
Tels. 643-9840 \* 643-9849 \* 387-6798 \* 703-1939 \* 666-4904  
Fax No. 643-9760  
E-mail: [info@superglobeinc.com](mailto:info@superglobeinc.com)

02 June 2015

To: Sonia Mendoza  
Eco-Waste Coalition  
President

Manny C. Calonzo  
International POPs Elimination Network  
Co-Chair

Dear Sir/Madam:

Greetings!

We would like to express our gratitude and appreciation for all your efforts to eliminate lead in household enamel paints. The whole company completely agrees with your vision and objective.

While we must all understand that removing lead is a primordial concern, lead has been with us for the last 2 decades or so; consequently, taking them out of our current formulas will take time and efforts.

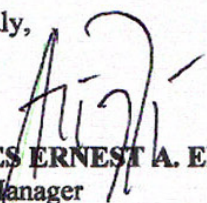
We all know that paint should be lead-free by end of 2016; thus, we have already made some ground in attaining the objective, namely, the following:

1. Resorting to other suppliers who can provide raw materials without lead
2. Reformulating our products without affecting the price and quality of the products
3. Redesigning our packaging labels.

With all of these, I am now seeking your patience and understanding as this is not an easy task. Rest assured that we are constantly monitoring developments within and without our company premises in ensuring a lead-free paint environment.

Thank you.

Yours Truly,

  
**CHARLES ERNEST A. ELE**  
General Manager

## Appendix B

### 6. Times Paint Corporation



June 2, 2015

**Ms. SONIA MENDOZA**

President, EcoWaste Coalition  
Unit 329, Eagle Court Condominium  
Matalino Street, Quezon City

**Attention: Mr. MANNY C. CALONZO, Co-Chair, IPEN**

Dear Madam:

Warmest greetings from Times Paint Corporation!

We, at Times Paint Corporation, firmly believe that there's no conflict between economic prosperity and environmental stewardship. In fact, the two are actually mutually dependent upon each other. Like many other companies, we embrace sustainability as a key to our economic future.

Being the oldest and one of the most trusted paint manufacturer operating in the Philippines, we firmly believe that we have a responsibility to our customers in taking action to minimize and, whenever possible, eliminate hazardous, toxic chemicals. In this regard, we stand committed in reducing to manageable levels, or even eliminate, the presence of lead in all our products.

And while we know that our initiatives may affect our business in the short term, we believe that in order to grow, businesses should embrace sustainability, as they will prove to be more efficient, have lower costs, be less reliant on scarce commodities and escalating prices, increase their use of sustainable and recycled materials, have a better relationship with all of their stakeholders and ultimately, be able to offer the best quality paints at the lowest possible prices.

Regards,

**REGINALD T. YU**

President  
Times Paint Corporation



7. Treasure Island Industrial Corporation



June 3, 2015

**Ms. Sonia Mendoza**  
President, EcoWaste Coalition

**Mr. Manny Calonzo**  
Co-Chair, IPEN

Dear Ms. Mendoza and Mr. Calonzo,

Good day!

**Treasure Island Industrial Corporation** and **EcoWaste Coalition** have been on the same page on the elimination of Leaded paints in the Philippines. Through our Lead-free conversion initiatives that started in 2013, the company has been striving to eliminate Lead in all our products from our common household paints to our highly specialized industrial paints headed by our Research and Development Group.

As of now, 50% of our Lead-containing household paints have been converted to Lead-free. With the conversion, new brands will be launched that will separate the Lead-free product of **Island Premium Paints**. Currently, the QDE (Quick Drying Enamel) product line took the lead with its new brand "COLOR QUICK".

As a commitment to the community, **Treasure Island Industrial Corporation** with its brand **Island Premium Paints** has committed to ensure that 100% of its household paint be Lead-free at the end of 2015. The company has also extended its commitment to its industrial paint product line to be Lead-free at the end of 2018.

Being stewards of our community we are proud to have **EcoWaste Coalition** as our partner in this thrust.

Sincerely,

  
**Emmanuel O. Ong**  
Senior Vice President  
Chem/Paints Division Head



Information Office: 03-03 Plaridel St., Cebu City 6000, Philippines  
Tel: 256-1197 to 99 256-1150, 256-2228, 256-2226 \* Fax: (603-32) 2552656  
Head Office: No. 2 3rd Avenue 5, Carmela Bldg., North Reclamation Area, Cebu City 6000 Philippines  
Tel: 252-0513 to 17 \* Fax: (603-32) 252-0518  
E-mail: [www@islandpaints.com](mailto:www@islandpaints.com) \* Website: [www.islandpaints.com](http://www.islandpaints.com)

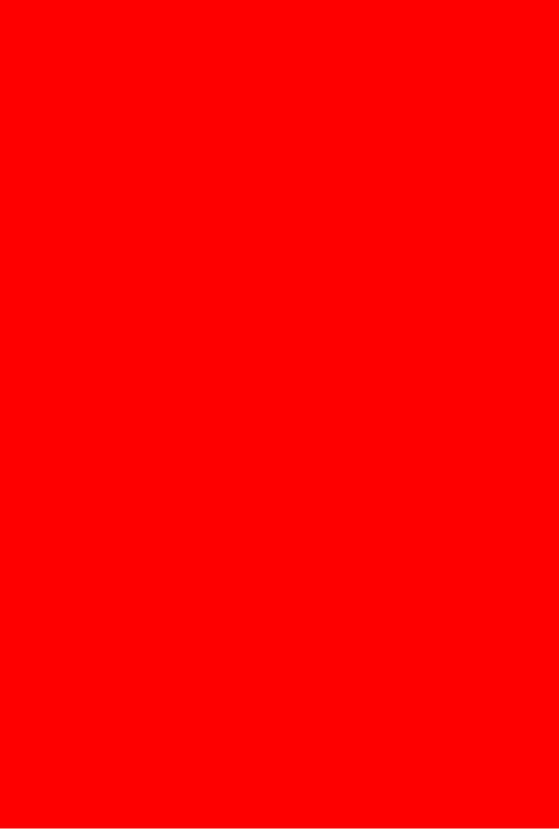


## Appendix C

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## NATIONAL REPORT

LEAD IN NEW ENAMEL HOUSEHOLD PAINTS  
IN THE PHILIPPINES: THE 2015 REPORT

June 2015

