LEAD IN SPRAY PAINTS FOR CONSUMER USE IN THE PHILIPPINES

July 2020
ACKNOWLEDGMENTS

We take this opportunity to thank all those who were instrumental in compiling and shaping this study, especially Manny Calonzo and Thony Dizon who purchased the spray paint samples from retailers in 20 cities and one municipality in Metro Manila and Luzon regions, and the Global Lead Paint Elimination Campaign Team of the International Pollutants Elimination Network (IPEN) for their strategic guidance and support. We also thank the Philippine Association of Paint Manufacturers (PAPM) for their invaluable feedback on the study findings and recommendations, and for their efforts to promote industrial compliance to the country’s lead paint regulation.

This report presents the first publicly available data on the total lead concentrations of paints in aerosol cans, popularly referred to as spray paints, which are sold for consumer or general use by paint shops and various retail outlets in the Philippines. The report also recommends action steps by different stakeholders to protect children and other vulnerable groups from exposure to lead.

This report was undertaken as part of the EcoWaste Coalition’s Campaign on Toxic Chemicals in Products and IPEN’s Global Lead Paint Elimination Campaign. It was conducted in the Philippines by the EcoWaste Coalition in partnership with IPEN, and funded by the Swedish Society for Nature Conservation (SSNC). Responsibility for the content of this report lies entirely with the EcoWaste Coalition and IPEN.

Established in 1998, IPEN is the global environmental network of nearly 600 public interest NGOs in over 125 countries working to eliminate and reduce the most hazardous substances to forge a toxics-free future for all. Additional information materials about IPEN’s Global Lead Paint Elimination Campaign can be accessed at: https://ipen.org/projects/eliminating-lead-paint

Founded in 2000, the EcoWaste Coalition is a non-profit network of over 140 public interest groups in the Philippines that have coalesced to advance “a zero waste and toxics-free society where communities enjoy a safe and healthy environment.”

EcoWaste Coalition
78-A Masigla St. Extension, Barangay Central,
1100 Quezon City, Philippines
www.ecowastecoalition.org

This document has been produced with the financial contribution by the Swedish International Development Co-operation Agency (SIDA) through the Swedish Society for Nature Conservation (SSNC). The views herein shall not necessarily be taken to reflect the official opinion of SSNC or its donors.
CONTENTS

Contents ........................................................................................................................................ iii

1. Background ........................................................................................................................... 4
   1.1 Brief Overview of Health and Economic Impacts of Lead Exposure .................................. 4
   1.2 The Use of Lead in Paint ................................................................................................. 5
   1.3 Regulatory Framework in the Philippines ....................................................................... 6

2. Results ..................................................................................................................................... 8

3. Conclusions and Recommendations ................................................................................. 12

References ................................................................................................................................ 13

Appendix ................................................................................................................................... 14
   Materials and Methods ........................................................................................................... 14
1. BACKGROUND

1.1 BRIEF OVERVIEW OF HEALTH AND ECONOMIC IMPACTS OF LEAD EXPOSURE

Children are exposed to lead from paint when surfaces painted with lead-containing paint begins to chip or deteriorate, since this causes lead to be released to dust and soil.\(^1\) This is then ingested through normal hand-to-mouth behavior by children. They might also pick up paint chips and put them directly into their mouths, which can be especially harmful since the lead content is typically much higher than what is found in dust and soils. When toys, play equipment, or other articles are painted with lead paint, children may directly ingest the lead-contaminated, dried paint when chewing on them. Playground equipment can also be a direct source of exposure since children will get lead paint on their hands when playing. In addition, lead exposure can occur through inhalation.

Lead exposure is especially harmful to children, especially aged six and under. 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 can also affect the blood system, the kidneys, and the skeleton.\(^5\) Lead is also categorized as an endocrine-disrupting chemical (EDC).\(^6\)

According to the World Health Organization (WHO): “There is no known level of lead exposure that is considered safe.”\(^8\)

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.\(^9\) 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 dol-
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.

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. Lead-based paints 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.\(^{[11-13]}\)

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.

Paints without added lead 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.

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.
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 such as in playground equipment which highly likely contributes 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 current standard for decorative paints in e.g., the U.S., the Philippines, India, and China 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. This standard is also recommended for all paints, including paints for industrial applications, in the Model Law and Guidance for Regulating Lead Paint,* which was developed by the Global Alliance to Eliminate Lead Paint (GAELP) and published by the UN Environment Programme.

1.3 REGULATORY FRAMEWORK IN THE PHILIPPINES

The Philippines through the Department of Environment and Natural Resources (DENR) Administrative Order 2013-24, also known as the Chemical Control Order for Lead and Lead Compounds (or the CCO), establishes 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.

The CCO sets a phase-out deadline of three years (2013-2016) for lead-containing paints used for architectural, decorative and household applications, and six years (2013-2019) for lead-containing paints used for industrial applications. By 2020, the Philippines would have completed the phase-out of lead-containing paints covering all paint categories.

Complementary directives issued by the Department of Education (DepEd), the Department of Interior and Local Government (DILG) and the Department of Social Work and Development (DSWD) further reinforced the required use of lead-safe paints in line with DENR A.O. 2013-24. DepEd Order 4, Series of 2017 on the “Mandatory Use of Lead-Safe Paints in Schools” requires the use of independently certified lead-safe paints/coatings in the painting and repainting, among other things, of school facilities and amenities such as playground, covered court and the like.

DILG Memorandum Circular 2018-26 on the “Mandatory Use of Lead-Safe Paints by Local Government Units (LGUs)” enjoins provincial governors, city mayors, municipal mayors and barangay chairpersons to adopt a “Lead-Safe Paint Procurement Policy” for painting jobs paid out of public funds. This circular further instructs local officials to ensure prohibited uses of lead, including their use in indoor and outdoor playground equipment, are duly observed.

The DSWD memorandum issued in 2017 requires the use of lead safe paints as a mandatory requirement in facilities catering to disadvantaged and vulnerable sectors. According to the memorandum, “the 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. RESULTS

From November 2, 2019 to February 25, 2020, 87 cans of spray paints intended for consumer or general use were purchased by the EcoWaste Coalition from paint, home improvement, general merchandise and office and school supplies stores in 20 cities (12 in Metro Manila and eight other cities in Batangas, Benguet, Cavite, Laguna, Nueva Ecija, Pampanga, Rizal, and Zambales provinces) and one municipality (Baliuag, Bulacan).

The paints represented 37 different brands produced by 23 manufacturers in seven countries, including Canada, China, Indonesia, Malaysia, Taiwan, Thailand and the USA. However, 39 of the samples provided no information as to their manufacturers, importers or distributors, while 43 samples lacked information about their countries of manufacture. Among the lead spray paints detected were products imported from countries with existing legally-binding lead paint regulations such as China and Thailand.

As confirmed by the Philippine Association of Paint Manufacturers (PAPM) with the EcoWaste Coalition and IPEN, none of the analyzed samples in this study was produced by companies affiliated with the PAPM.

In most cases, bright-colored paints such as yellow, orange, green or red were selected. The availability of these paints in retail establishments suggested that they were intended to be used within home and school environments.

Each spray paint was first applied onto individually numbered duplicates of labeled wood pieces and then screened for lead using...
Figure 2: Photo of the analyzed spray paint samples.

Figure 3: A volunteer sprays the paint on a wood lath prior to XRF screening.
a handheld Olympus Innov-X Delta X-Ray Fluorescence (XRF) analytical device after the sample had dried at room temperature.

The aerosol cans of samples that screened positive for lead in excess of 90 ppm were then sent to SGS Philippines for confirmatory analysis using US EPA Method 3052:1996 and performed through inductively coupled plasma - optical emission spectrometry (ICP-OES).

This study shows that:

- 37 out of 87 analyzed spray paints representing 19 brands were lead paints, i.e., they contained lead concentrations above 90 ppm, dry weight. In addition, 29 paints contained dangerously high lead concentrations above 10,000 ppm.
- 19 out of 37 analyzed brands sold at least one lead paint, i.e., a paint with lead concentration above 90 ppm. Also, 16 of the 37 analyzed brands sold at least one paint with dangerously high lead concentrations above 10,000 ppm.
- 35 of the 73 bright-colored paints were lead paints, i.e., they contained lead concentrations above 90 ppm. Yellow paints were the most hazardous with 14 paints containing lead concentrations greater
than 10,000 ppm, while 11 green paints also contained dangerously high lead concentrations above 10,000 ppm.

- The two samples with the highest lead concentrations detected were a green King Sfon spray paint (country of manufacture not indicated) with 82,100 ppm and a yellow PowerBon spray paint imported from Taiwan with 64,000 ppm.

- Only one of the 19 analyzed brands with lead paints provided information about lead on their labels and most paints carried little information about ingredients. Four samples with “No Pb” pictogram on their labels were found to have dangerously high lead concentrations ranging from 14,600 to 33,300 ppm.
3. CONCLUSIONS AND RECOMMENDATIONS

The results of this study provide a strong justification for the strict monitoring of compliance to the country’s groundbreaking lead paint regulation that bans total lead content above 90 ppm in all types of paint products, including paints in aerosol cans. The fact that 37 of the 87 analyzed spray paints had total lead concentrations above the regulatory limit, of which 29 contained dangerous high lead levels exceeding 10,000 ppm, underscores this apparent need for effective compliance monitoring to ensure that only lead-safe paints are offered for sale to consumers. Ensuring that spray paints pose no lead-based hazards is absolutely required as these paints are marketed as ideal for almost all types of surfaces and painting applications - e.g., as a touch-up paint for cars and household appliances, as a material for school projects and as a convenient stuff for sprucing up accessories and decors – and are accessible to all consumers.

To promote full compliance to the country’s phase-out of all lead-containing paints, the EcoWaste Coalition and IPEN recommend the following:

For the Department of Environment and Natural Resources (DENR) to convene a multistakeholders’ dialogue to recognize successes, determine gaps and identify steps toward a more effective enforcement of the regulation banning all lead paints.

For paint manufacturers, importers and distributors to take back their remaining stocks of old lead-containing paints from all retail outlets.

For paint manufacturers, including those that export to the Philippines, to obtain third-party Lead Safe Paint® certification to assist consumers in making an informed choice when buying paints.

For consumers to insist on their rights to product information and to product safety and to refrain from buying inadequately labeled and uncertified paint products.

For all stakeholders to support policies and programs that will contribute to reduced children’s, women’s and workers’ exposure to lead from lead-containing paint, dust and soil.
REFERENCES


[16] Da Rocha Silva, et al., High blood lead levels are associated with lead concentrations in households and day care centers attended by Brazilian preschool children. Environmental Pollution, 2018. 239: p. 681-688.


MATERIALS AND METHODS

For this study, the EcoWaste Coalition procured a total of 87 cans of spray paints intended for home or general use. The samples, costing P50 to P450 per unit, were obtained on November 2, 2019 to February 25, 2020 from diverse retail outlets, including hardware stores, home improvement centers, general merchandise vendors, and office and school supplies shops located in 20 cities in Metro Manila (Caloocan, Las Piñas, Makati, Mandaluyong, Manila, Marikina, Muntinlupa, Pasay, Quezon, San Juan, Taguig and Valenzuela Cities) and the provinces (Tanauan City, Batangas; Baguio City, Benguet; Imus City, Cavite; Sta. Rosa City, Laguna; Gapan City, Nueva Ecija; Angeles City, Pampanga; Antipolo City, Rizal; and Olongapo City, Zambales), and one municipality (Baliuag, Bulacan).

Paints representing 37 different brands produced by 23 manufacturers based in Canada, China, Indonesia, Malaysia, Taiwan, Thailand and the USA were purchased. Thirty-nine of the 87 samples provided no information as to which companies manufactured, imported or distributed them, and 43 of the samples indicated no information as to their countries of manufacture.

In most cases, bright-colored paints such as yellow, orange, green or red were selected. The availability of these paints in retail establishments

Figure 5: Photo of the 15 spray paint samples with highest lead concentrations.
suggested that they were intended to be used within home and school environments.

The EcoWaste Coalition first screened the samples for lead using a hand-held Olympus Innov-X Delta X-Ray Fluorescence (XRF) analytical device. The samples were sprayed onto individually numbered duplicates of labeled wood pieces, dried at room temperature and then subjected to XRF screening. The gadget’s limit of detection for lead is 3 -7 ppm. To ensure accurate analyses, calibrations were performed when the XRF analyzer is started or restarted.

Spray paint samples that were found to contain total lead content above 90 ppm, as per XRF screening, were selected for confirmatory analysis by SGS Philippines, a government-accredited testing company with a network of offices and laboratories across the country. The analysis was carried out based on the US EPA Method 3052:1996, and performed by inductively coupled plasma - optical emission spectrometry (ICP-OES).

**TABLE 1. TOP FIFTEEN SPRAY PAINTS WITH THE HIGHEST LEAD CONTENT.**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Brand</th>
<th>Manufacturer (Country of Manufacture)</th>
<th>Color</th>
<th>Lead Content (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>King Sfon</td>
<td>Not indicated</td>
<td>Green</td>
<td>82,100</td>
</tr>
<tr>
<td>2</td>
<td>PowerBon</td>
<td>PowerBon Co. Ltd. (Taiwan)</td>
<td>Yellow</td>
<td>64,000</td>
</tr>
<tr>
<td>3</td>
<td>Klomonkey</td>
<td>Not indicated</td>
<td>Green</td>
<td>58,800</td>
</tr>
<tr>
<td>4</td>
<td>Koby</td>
<td>Not indicated</td>
<td>Yellow</td>
<td>54,500</td>
</tr>
<tr>
<td>5</td>
<td>MR. D.I.Y.</td>
<td>Bricolage Distributor, Inc</td>
<td>Yellow</td>
<td>50,700</td>
</tr>
<tr>
<td>6</td>
<td>JM</td>
<td>Not indicated</td>
<td>Green</td>
<td>49,700</td>
</tr>
<tr>
<td>7</td>
<td>Yandy</td>
<td>Not indicated</td>
<td>Yellow</td>
<td>47,500</td>
</tr>
<tr>
<td>8</td>
<td>Standard</td>
<td>Not indicated</td>
<td>Yellow</td>
<td>39,300</td>
</tr>
<tr>
<td>9</td>
<td>Parlux</td>
<td>P.L. Chemical (UK) Co. Ltd</td>
<td>Green</td>
<td>34,500</td>
</tr>
<tr>
<td>10</td>
<td>SuperMova</td>
<td>Not indicated</td>
<td>Yellow</td>
<td>34,500</td>
</tr>
<tr>
<td>11</td>
<td>Sinag</td>
<td>Not indicated</td>
<td>Yellow</td>
<td>33,300</td>
</tr>
<tr>
<td>12</td>
<td>JM</td>
<td>Not indicated</td>
<td>Yellow</td>
<td>32,500</td>
</tr>
<tr>
<td>13</td>
<td>Koby</td>
<td>Not indicated</td>
<td>Green</td>
<td>32,400</td>
</tr>
<tr>
<td>14</td>
<td>Lotus</td>
<td>Lotus Tool Group-Philippines (China)</td>
<td>Yellow</td>
<td>29,400</td>
</tr>
<tr>
<td>15</td>
<td>Yao Dong Bang</td>
<td>Not indicated</td>
<td>Green</td>
<td>29,300</td>
</tr>
<tr>
<td>Sample No.</td>
<td>Brand</td>
<td>Color</td>
<td>Volume</td>
<td>Price (PHP)</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>-------</td>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>PHL-01</td>
<td>Bosny</td>
<td>Yellow</td>
<td>400 cc</td>
<td>100</td>
</tr>
<tr>
<td>PHL-02</td>
<td>Champ</td>
<td>Yellow</td>
<td>400 ml</td>
<td>110</td>
</tr>
<tr>
<td>PHL-03</td>
<td>Koby</td>
<td>Yellow</td>
<td>450 ml</td>
<td>150</td>
</tr>
<tr>
<td>PHL-04</td>
<td>Lotus</td>
<td>Yellow</td>
<td>400 ml</td>
<td>108.50</td>
</tr>
<tr>
<td>PHL-05</td>
<td>Nikko</td>
<td>Yellow</td>
<td>400 cc</td>
<td>219.50</td>
</tr>
<tr>
<td>PHL-06</td>
<td>Pylox</td>
<td>Blue</td>
<td>400 cc</td>
<td>139.75</td>
</tr>
<tr>
<td>PHL-07</td>
<td>Pylox</td>
<td>Yellow</td>
<td>400 cc</td>
<td>120</td>
</tr>
<tr>
<td>PHL-08</td>
<td>Ace</td>
<td>Blue</td>
<td>340 g</td>
<td>219.75</td>
</tr>
<tr>
<td>PHL-09</td>
<td>Ace</td>
<td>Black</td>
<td>425 g</td>
<td>299.75</td>
</tr>
<tr>
<td>PHL-10</td>
<td>RJ London</td>
<td>Red</td>
<td>400 cc</td>
<td>299.75</td>
</tr>
<tr>
<td>PHL-11</td>
<td>Rust-Oleum</td>
<td>Yellow</td>
<td>340 g</td>
<td>220</td>
</tr>
<tr>
<td>PHL-12</td>
<td>VHT</td>
<td>Orange</td>
<td>329 g</td>
<td>450</td>
</tr>
<tr>
<td>PHL-13</td>
<td>White Tiger</td>
<td>Black</td>
<td>450 ml</td>
<td>60</td>
</tr>
<tr>
<td>PHL-14</td>
<td>Krylon</td>
<td>Yellow</td>
<td>340 g</td>
<td>220</td>
</tr>
<tr>
<td>PHL-15</td>
<td>RJ London</td>
<td>Yellow</td>
<td>400 cc</td>
<td>220</td>
</tr>
<tr>
<td>PHL-16</td>
<td>Sherlux</td>
<td>Yellow</td>
<td>400 cc</td>
<td>220</td>
</tr>
<tr>
<td>PHL-17</td>
<td>Abro</td>
<td>Black</td>
<td>227 g</td>
<td>191.80</td>
</tr>
<tr>
<td>PHL-18</td>
<td>Premium Decor</td>
<td>Red</td>
<td>340 g</td>
<td>395</td>
</tr>
<tr>
<td>PHL-19</td>
<td>Premium Decor</td>
<td>Orange</td>
<td>340 g</td>
<td>395</td>
</tr>
<tr>
<td>PHL-20</td>
<td>Krylon</td>
<td>Orange</td>
<td>340 g</td>
<td>220</td>
</tr>
<tr>
<td>PHL-21</td>
<td>Valspar</td>
<td>Black</td>
<td>340 g</td>
<td>110</td>
</tr>
<tr>
<td>PHL-22</td>
<td>Valspar</td>
<td>Purple</td>
<td>340 g</td>
<td>110</td>
</tr>
<tr>
<td>PHL-23</td>
<td>Spray Paint</td>
<td>Clear</td>
<td>400 ml</td>
<td>100</td>
</tr>
<tr>
<td>Sample No.</td>
<td>Brand</td>
<td>Color</td>
<td>Volume</td>
<td>Price (PHP)</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>------------</td>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>PHL-24</td>
<td>Colorz</td>
<td>Yellow</td>
<td>400 ml</td>
<td>93</td>
</tr>
<tr>
<td>PHL-25</td>
<td>Pylox</td>
<td>Green</td>
<td>400 cc</td>
<td>110.75</td>
</tr>
<tr>
<td>PHL-26</td>
<td>Standard</td>
<td>Red</td>
<td>400 ml</td>
<td>120</td>
</tr>
<tr>
<td>PHL-27</td>
<td>Standard</td>
<td>Yellow</td>
<td>400 ml</td>
<td>120</td>
</tr>
<tr>
<td>PHL-28</td>
<td>Bosny</td>
<td>Orange</td>
<td>400 cc</td>
<td>170</td>
</tr>
<tr>
<td>PHL-29</td>
<td>JM</td>
<td>Red</td>
<td>400 ml</td>
<td>99</td>
</tr>
<tr>
<td>PHL-30</td>
<td>JM</td>
<td>Yellow</td>
<td>400 ml</td>
<td>99.75</td>
</tr>
<tr>
<td>PHL-31</td>
<td>RSTAR</td>
<td>Red</td>
<td>400 ml</td>
<td>99.75</td>
</tr>
<tr>
<td>PHL-32</td>
<td>RSTAR</td>
<td>Yellow</td>
<td>400 ml</td>
<td>99.75</td>
</tr>
<tr>
<td>PHL-33</td>
<td>Uni-Tech</td>
<td>Orange</td>
<td>400 ml</td>
<td>89.75</td>
</tr>
<tr>
<td>PHL-34</td>
<td>Uni-Tech</td>
<td>Yellow</td>
<td>400 ml</td>
<td>89.75</td>
</tr>
<tr>
<td>PHL-35</td>
<td>X-O Rust</td>
<td>Orange</td>
<td>340 g</td>
<td>295</td>
</tr>
<tr>
<td>PHL-36</td>
<td>Klomonkey</td>
<td>Green</td>
<td>450 ml</td>
<td>57</td>
</tr>
<tr>
<td>PHL-37</td>
<td>Klomonkey</td>
<td>Red</td>
<td>450 ml</td>
<td>53</td>
</tr>
<tr>
<td>PHL-38</td>
<td>White Tiger</td>
<td>Red</td>
<td>450 ml</td>
<td>53</td>
</tr>
<tr>
<td>PHL-39</td>
<td>White Tiger</td>
<td>Clear</td>
<td>450 ml</td>
<td>53</td>
</tr>
<tr>
<td>PHL-40</td>
<td>Standard</td>
<td>Green</td>
<td>400 ml</td>
<td>53</td>
</tr>
<tr>
<td>PHL-41</td>
<td>Anton</td>
<td>Red</td>
<td>400 ml</td>
<td>84</td>
</tr>
<tr>
<td>PHL-42</td>
<td>Pross</td>
<td>Green</td>
<td>400 g</td>
<td>50</td>
</tr>
<tr>
<td>PHL-43</td>
<td>Botny</td>
<td>Maroon</td>
<td>400 ml</td>
<td>111</td>
</tr>
<tr>
<td>PHL-44</td>
<td>White Tiger</td>
<td>Red</td>
<td>450 ml</td>
<td>53</td>
</tr>
<tr>
<td>PHL-45</td>
<td>JM</td>
<td>Green</td>
<td>400 ml</td>
<td>90</td>
</tr>
<tr>
<td>PHL-46</td>
<td>Sinag (white body)</td>
<td>Yellow</td>
<td>400 ml</td>
<td>82</td>
</tr>
<tr>
<td>Sample No.</td>
<td>Brand</td>
<td>Color</td>
<td>Volume</td>
<td>Price (PHP)</td>
</tr>
<tr>
<td>------------</td>
<td>------------</td>
<td>----------</td>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>PHL-47</td>
<td>Sinag</td>
<td>Yellow</td>
<td>400 ml</td>
<td>82</td>
</tr>
<tr>
<td></td>
<td>(green body)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHL-48</td>
<td>SupeMova</td>
<td>Yellow</td>
<td>400 cc</td>
<td>82</td>
</tr>
<tr>
<td>PHL-49</td>
<td>RSTAR</td>
<td>Green</td>
<td>400 ml</td>
<td>99.75</td>
</tr>
<tr>
<td>PHL-50</td>
<td>Uni-Tech</td>
<td>Green</td>
<td>400 ml</td>
<td>99.75</td>
</tr>
<tr>
<td>PHL-51</td>
<td>Koby</td>
<td>Red</td>
<td>450 ml</td>
<td>150</td>
</tr>
<tr>
<td>PHL-52</td>
<td>Koby</td>
<td>Green</td>
<td>450 ml</td>
<td>150</td>
</tr>
<tr>
<td>PHL-53</td>
<td>Lotus</td>
<td>Red</td>
<td>400 ml</td>
<td>109</td>
</tr>
<tr>
<td>PHL-54</td>
<td>PowerBon</td>
<td>Yellow</td>
<td>400 ml</td>
<td>199.75</td>
</tr>
<tr>
<td>PHL-55</td>
<td>Colorz</td>
<td>Green</td>
<td>400 ml</td>
<td>160</td>
</tr>
<tr>
<td>PHL-56</td>
<td>Colorz</td>
<td>Red</td>
<td>400 ml</td>
<td>160</td>
</tr>
<tr>
<td>PHL-57</td>
<td>PowerBon</td>
<td>Green</td>
<td>400 ml</td>
<td>199.75</td>
</tr>
<tr>
<td>PHL-58</td>
<td>Z-Spray</td>
<td>Red</td>
<td>400 cc</td>
<td>119.75</td>
</tr>
<tr>
<td>PHL-59</td>
<td>Duwell</td>
<td>Yellow</td>
<td>400 ml</td>
<td>100</td>
</tr>
<tr>
<td>PHL-60</td>
<td>Yao Dong</td>
<td>Blue</td>
<td>400 ml</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Bang</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHL-61</td>
<td>Yao Dong</td>
<td>Green</td>
<td>400 ml</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Bang</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHL-62</td>
<td>Botny</td>
<td>Yellow</td>
<td>400 ml</td>
<td>105</td>
</tr>
<tr>
<td>PHL-63</td>
<td>Standard</td>
<td>Yellow</td>
<td>400 ml</td>
<td>111</td>
</tr>
<tr>
<td>PHL-64</td>
<td>Sinag</td>
<td>Green</td>
<td>400 ml</td>
<td>89.75</td>
</tr>
<tr>
<td>PHL-65</td>
<td>Sinag</td>
<td>Orange</td>
<td>400 ml</td>
<td>89.75</td>
</tr>
<tr>
<td>PHL-66</td>
<td>Champ</td>
<td>Green</td>
<td>400 ml</td>
<td>110</td>
</tr>
<tr>
<td>PHL-67</td>
<td>Bosny</td>
<td>Red</td>
<td>400 cc</td>
<td>112</td>
</tr>
<tr>
<td>PHL-68</td>
<td>Klomonkey</td>
<td>White</td>
<td>450 ml</td>
<td>55</td>
</tr>
<tr>
<td>PHL-69</td>
<td>Botny</td>
<td>Orange</td>
<td>400 ml</td>
<td>105</td>
</tr>
<tr>
<td>PHL-70</td>
<td>Botny</td>
<td>Green</td>
<td>400 ml</td>
<td>299</td>
</tr>
<tr>
<td>PHL-71</td>
<td>Bosny</td>
<td>Green</td>
<td>400 cc</td>
<td>120</td>
</tr>
<tr>
<td>Sample No.</td>
<td>Brand</td>
<td>Color</td>
<td>Volume</td>
<td>Price (PHP)</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td>-----------</td>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>PHL-72</td>
<td>SupeMova</td>
<td>Cream</td>
<td>400 cc</td>
<td>83</td>
</tr>
<tr>
<td>PHL-73</td>
<td>SupeMova</td>
<td>Purple</td>
<td>400 cc</td>
<td>83</td>
</tr>
<tr>
<td>PHL-74</td>
<td>Bosny</td>
<td>Red</td>
<td>400 cc</td>
<td>108.95</td>
</tr>
<tr>
<td>PHL-75</td>
<td>Posny</td>
<td>Yellow</td>
<td>400 g</td>
<td>120</td>
</tr>
<tr>
<td>PHL-76</td>
<td>PowerBon</td>
<td>Red</td>
<td>400 ml</td>
<td>199.75</td>
</tr>
<tr>
<td>PHL-77</td>
<td>MR. D.I.Y.</td>
<td>Green</td>
<td>400 ml</td>
<td>85</td>
</tr>
<tr>
<td>PHL-78</td>
<td>MR. D.I.Y.</td>
<td>Red</td>
<td>400 ml</td>
<td>85</td>
</tr>
<tr>
<td>PHL-79</td>
<td>MR. D.I.Y.</td>
<td>Yellow</td>
<td>400 ml</td>
<td>85</td>
</tr>
<tr>
<td>PHL-80</td>
<td>Yandy</td>
<td>Green</td>
<td>400 ml</td>
<td>120</td>
</tr>
<tr>
<td>PHL-81</td>
<td>Yandy</td>
<td>Red</td>
<td>400 ml</td>
<td>120</td>
</tr>
<tr>
<td>PHL-82</td>
<td>Yandy</td>
<td>Yellow</td>
<td>400 ml</td>
<td>120</td>
</tr>
<tr>
<td>PHL-83</td>
<td>Parlux</td>
<td>Green</td>
<td>400 cc</td>
<td>100</td>
</tr>
<tr>
<td>PHL-84</td>
<td>Parlux</td>
<td>Red</td>
<td>400 cc</td>
<td>100</td>
</tr>
<tr>
<td>PHL-85</td>
<td>MR. D.I.Y.</td>
<td>Green</td>
<td>400 ml</td>
<td>95</td>
</tr>
<tr>
<td>PHL-86</td>
<td>Yao Dong Bang</td>
<td>Red</td>
<td>400 ml</td>
<td>100</td>
</tr>
<tr>
<td>PHL-87</td>
<td>King Sfon</td>
<td>Green</td>
<td>400 ml</td>
<td>100</td>
</tr>
<tr>
<td>Sample No.</td>
<td>Brand</td>
<td>Color</td>
<td>Lead Content, Dry Weight (ppm)</td>
<td>Country of Brand Headquarters</td>
</tr>
<tr>
<td>-----------</td>
<td>---------</td>
<td>-------</td>
<td>--------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>PHL-03</td>
<td>Koby</td>
<td>Yellow</td>
<td>54,500</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-04</td>
<td>Lotus</td>
<td>Yellow</td>
<td>29,400</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-06</td>
<td>Pylox</td>
<td>Blue</td>
<td>644</td>
<td>Japan</td>
</tr>
<tr>
<td>PHL-24</td>
<td>Colorz</td>
<td>Yellow</td>
<td>13,200</td>
<td>Thailand</td>
</tr>
<tr>
<td>PHL-27</td>
<td>Standard</td>
<td>Yellow</td>
<td>18,500</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-30</td>
<td>JM</td>
<td>Yellow</td>
<td>32,500</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-32</td>
<td>RSTAR</td>
<td>Yellow</td>
<td>18,100</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-33</td>
<td>Uni-Tech</td>
<td>Orange</td>
<td>11,700</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-34</td>
<td>Uni-Tech</td>
<td>Yellow</td>
<td>14,700</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-36</td>
<td>Klomonkey</td>
<td>Green</td>
<td>58,800</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-38</td>
<td>White Tiger</td>
<td>Red</td>
<td>14,300</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-40</td>
<td>Standard</td>
<td>Green</td>
<td>20,400</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-41</td>
<td>Anton</td>
<td>Red</td>
<td>5,900</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-45</td>
<td>JM</td>
<td>Green</td>
<td>49,700</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-46</td>
<td>Sinag (white body)</td>
<td>Yellow</td>
<td>33,300</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-47</td>
<td>Sinag (green body)</td>
<td>Yellow</td>
<td>18,100</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-48</td>
<td>SupeMova</td>
<td>Yellow</td>
<td>34,500</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-49</td>
<td>RSTAR</td>
<td>Green</td>
<td>17,800</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-50</td>
<td>Uni-Tech</td>
<td>Green</td>
<td>9,100</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-51</td>
<td>Koby</td>
<td>Red</td>
<td>12,800</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-52</td>
<td>Koby</td>
<td>Green</td>
<td>32,400</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-54</td>
<td>PowerBon</td>
<td>Yellow</td>
<td>64,000</td>
<td>Taiwan</td>
</tr>
<tr>
<td>Sample No.</td>
<td>Brand</td>
<td>Color</td>
<td>Lead Content, Dry Weight (ppm)</td>
<td>Country of Brand Headquarters</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------</td>
<td>-------</td>
<td>-------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>PHL-55</td>
<td>Colorz</td>
<td>Green</td>
<td>3,000</td>
<td>Thailand</td>
</tr>
<tr>
<td>PHL-56</td>
<td>Colorz</td>
<td>Red</td>
<td>665</td>
<td>Thailand</td>
</tr>
<tr>
<td>PHL-57</td>
<td>PowerBon</td>
<td>Green</td>
<td>21,200</td>
<td>Taiwan</td>
</tr>
<tr>
<td>PHL-61</td>
<td>Yao Dong Bang</td>
<td>Green</td>
<td>29,300</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-63</td>
<td>Standard</td>
<td>Yellow</td>
<td>39,300</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-64</td>
<td>Sinag</td>
<td>Green</td>
<td>14,600</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-65</td>
<td>Sinag</td>
<td>Orange</td>
<td>24,000</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-72</td>
<td>SupeMova</td>
<td>Cream</td>
<td>8,100</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-76</td>
<td>PowerBon</td>
<td>Red</td>
<td>17,800</td>
<td>Taiwan</td>
</tr>
<tr>
<td>PHL-79</td>
<td>MR. D.I.Y.</td>
<td>Yellow</td>
<td>50,700</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-80</td>
<td>Yandy</td>
<td>Green</td>
<td>26,500</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-82</td>
<td>Yandy</td>
<td>Yellow</td>
<td>47,500</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-83</td>
<td>Parlux</td>
<td>Green</td>
<td>34,500</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-84</td>
<td>Parlux</td>
<td>Red</td>
<td>1,700</td>
<td>Unknown</td>
</tr>
<tr>
<td>PHL-87</td>
<td>King Sfon</td>
<td>Green</td>
<td>82,100</td>
<td>Unknown</td>
</tr>
</tbody>
</table>
TABLE 4. DISTRIBUTION OF LEAD CONCENTRATION BY COLOR.

<table>
<thead>
<tr>
<th>Color</th>
<th>No. of Samples</th>
<th>No. of Samples Above 90 ppm</th>
<th>No. of Samples Above 10,000 ppm</th>
<th>Minimum Lead Content (ppm)</th>
<th>Maximum Lead Content (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>13,200</td>
<td>64,000</td>
</tr>
<tr>
<td>Green</td>
<td>13</td>
<td>13</td>
<td>11</td>
<td>3,000</td>
<td>82,100</td>
</tr>
<tr>
<td>Red</td>
<td>6</td>
<td>6</td>
<td>3</td>
<td>665</td>
<td>17,800</td>
</tr>
<tr>
<td>Orange</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>11,700</td>
<td>24,000</td>
</tr>
<tr>
<td>Blue</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>644</td>
<td>644</td>
</tr>
<tr>
<td>Cream</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>8,100</td>
<td>8,100</td>
</tr>
</tbody>
</table>

TABLE 5. LIST OF BRANDS WITH AT LEAST ONE PAINT EXCEEDING THE 90 PPM TOTAL LEAD CONTENT LIMIT.

<table>
<thead>
<tr>
<th>Paint Brand</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anton</td>
<td>Red</td>
</tr>
<tr>
<td>Colorz</td>
<td>Green, red, yellow</td>
</tr>
<tr>
<td>JM</td>
<td>Green, yellow</td>
</tr>
<tr>
<td>King Sfon</td>
<td>Green</td>
</tr>
<tr>
<td>Klomonkey</td>
<td>Green</td>
</tr>
<tr>
<td>Koby</td>
<td>Green, red, yellow</td>
</tr>
<tr>
<td>Lotus</td>
<td>Yellow</td>
</tr>
<tr>
<td>MR. D.I.Y.</td>
<td>Yellow</td>
</tr>
<tr>
<td>Parlux</td>
<td>Green, red</td>
</tr>
<tr>
<td>Pylox</td>
<td>Blue</td>
</tr>
<tr>
<td>PowerBon</td>
<td>Green, red, yellow</td>
</tr>
<tr>
<td>RSTAR</td>
<td>Green, yellow</td>
</tr>
<tr>
<td>Sinag</td>
<td>Green, orange, yellow</td>
</tr>
<tr>
<td>Standard</td>
<td>Green, yellow</td>
</tr>
<tr>
<td>SupeMova</td>
<td>Cream, yellow</td>
</tr>
<tr>
<td>Uni-Tech</td>
<td>Green, orange, yellow</td>
</tr>
<tr>
<td>White Tiger</td>
<td>Red</td>
</tr>
<tr>
<td>Yao Dong Bang</td>
<td>Green</td>
</tr>
<tr>
<td>Yandy</td>
<td>Green, yellow</td>
</tr>
</tbody>
</table>
**TABLE 6.** LIST OF BRANDS WITH AT LEAST ONE PAINT COMPLIANT WITH THE 90 PPM TOTAL LEAD CONTENT LIMIT.

<table>
<thead>
<tr>
<th>Paint Brand</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abro</td>
<td>Black</td>
</tr>
<tr>
<td>Ace</td>
<td>Black, blue</td>
</tr>
<tr>
<td>Bosny</td>
<td>Green, orange, red, yellow</td>
</tr>
<tr>
<td>Botny</td>
<td>Green, maroon, orange, yellow</td>
</tr>
<tr>
<td>Champ</td>
<td>Green, yellow</td>
</tr>
<tr>
<td>Duwell</td>
<td>Yellow</td>
</tr>
<tr>
<td>JM</td>
<td>Red</td>
</tr>
<tr>
<td>Krylon</td>
<td>Orange, yellow</td>
</tr>
<tr>
<td>Klomonkey</td>
<td>White, red</td>
</tr>
<tr>
<td>Lotus</td>
<td>Red</td>
</tr>
<tr>
<td>MR. D.I.Y.</td>
<td>Green, red</td>
</tr>
<tr>
<td>Nikko</td>
<td>Yellow</td>
</tr>
<tr>
<td>Pylox</td>
<td>Green, yellow</td>
</tr>
<tr>
<td>Posny</td>
<td>Yellow</td>
</tr>
<tr>
<td>Premium Décor</td>
<td>Red, orange</td>
</tr>
<tr>
<td>Pross</td>
<td>Green, red</td>
</tr>
<tr>
<td>RJ London</td>
<td>Red, yellow</td>
</tr>
<tr>
<td>RSTAR</td>
<td>Red</td>
</tr>
<tr>
<td>Rust-Oleum</td>
<td>Yellow</td>
</tr>
<tr>
<td>Sherlux</td>
<td>Yellow</td>
</tr>
<tr>
<td>Spray Paint</td>
<td>Clear</td>
</tr>
<tr>
<td>Standard</td>
<td>Red</td>
</tr>
<tr>
<td>SupeMova</td>
<td>Purple</td>
</tr>
<tr>
<td>Valspar</td>
<td>Black, purple</td>
</tr>
<tr>
<td>VHT</td>
<td>Orange</td>
</tr>
<tr>
<td>White Tiger</td>
<td>Black, clear, red</td>
</tr>
<tr>
<td>X-O Rust</td>
<td>Orange</td>
</tr>
<tr>
<td>Yao Dong Bang</td>
<td>Blue, red</td>
</tr>
<tr>
<td>Z-Spray</td>
<td>Red</td>
</tr>
</tbody>
</table>