

GET THE LEAD OUT OF PAINT BRUSHES



Eco Waste Coalition

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Executive Summary:

In support of the national and global drive to phase out lead paint and in pursuit of the group's key action point to "eliminate toxics in processes, products and wastes," the EcoWaste Coalition conducted an investigation to determine the availability of lead-safe paint brushes in local hardware stores and home improvement centers. From 25-27 August 2018, the group purchased a total of 75 branded and generic paint brushes from 40 retail outlets in eight cities in Metro Manila. The samples were screened for toxic metals, particularly lead, using a portable X-Ray Fluorescence (XRF) analytical device. The XRF screening showed 52 of the 75 paint brushes (69%) with mostly yellow painted handles had high lead content exceeding the regulatory limit. Department of Environment and Natural Resources (DENR) Administrative Order (A.O.) 2013-24, or the Chemical Control Order for Lead and Lead Compounds, prohibits paints containing lead above 90 parts per million (ppm) total lead content. Of the 52 lead-coated paint brushes, 41 had lead above 1,000 ppm, 23 had lead above 5,000 ppm and eight had lead above 10,000 ppm. This report provides a good basis to push hardware stores and home improvement centers to remove lead coated paint brushes off store shelves and to demand from their suppliers the provision of lead-safe paint brushes. With the phase-out of lead-containing decorative paints effective 31 December 2016, the EcoWaste Coalition deems it necessary that paint brushes should be free of lead well. As it is not unusual for paint brushes to be used for non-painting applications such as food preparations, the EcoWaste Coalition finds it all the more important to ensure that such brushes are free of lead paint hazard.

I. Background Information on the Health Effects of Lead and the Lead Paint Regulatory Framework in the Philippines:

1.1 Health Effects of Lead¹:

Children are exposed to lead from paint when lead-containing paint on walls, window seals, doors, banisters or other painted surfaces begins to chip or deteriorate, since this process releases lead to dust and soil. Lead dust is also produced, when a surface previously painted with lead paint is sanded or scraped in preparation for repainting, very large amounts of lead-contaminated dust is produced, which can also constitute a severe health hazard.²

Children playing indoors or outdoors get house dust or soil on their hands, and then ingest it through normal hand-to-mouth behavior. If the dust or the soil is contaminated with lead, the children will ingest lead. Hand-to-mouth behavior is especially prevalent in children aged six years and under, the age group most easily harmed by exposure to lead. A typical one- to six-year-old child ingests between 100 and 400 milligrams of house dust and soil each day.³

In some cases, children pick up paint chips and put them directly into their mouths. This can be especially harmful because the lead content of paint chips is typically much higher than what is found in dust and soils. When toys, household furniture, or other articles are painted with lead paint, children may directly ingest the lead-contaminated, dried paint when chewing on them. Nonetheless, the most common way that children ingest lead is through lead contaminated dust and soil that gets onto their hands.⁴

While lead exposure is also harmful to adults, lead exposure harms children at much lower levels. In addition, children absorb up to five times as much of ingested lead than adults. Children with nutritional deficiencies absorb ingested lead at an even increased rates.⁵

The younger the child, the more harmful lead can be and the health effects are generally irreversible and can have a lifelong impact. The human fetus is the most vulnerable, and a pregnant woman can transfer lead that has accumulated in her body to her developing child⁶. Lead is also transferred through breast milk when lead is present in a nursing mother.⁷

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.⁸ Lead is also categorized as an endocrine-disrupting chemical (EDC).⁹ 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.¹⁰

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."¹¹ 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.¹²

In recent years, medical researchers have been documenting significant health impacts in children from lower and lower levels of lead exposure.^{13, 14} According to a factsheet on Lead Poisoning and Health from WHO: "There is no known level of lead exposure that is considered safe."¹⁵

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.¹⁶ 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.¹⁷ 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.

1.2 Lead Paint Regulatory Framework in the Philippines¹⁸:

The Department of Environment and Natural Resources (DENR), after thoughtfully consulting with key government agencies, industry groups led by the Philippine Association of Paint Manufacturers (PAPM) and civil society organizations represented by the EcoWaste Coalition and IPEN, issued DENR Administrative Order (A.O.) 2013-24¹⁹, the groundbreaking legal and policy instrument regulating, limiting and prohibiting certain uses of lead and lead compounds, in the Philippines, including paint manufacturing. This A.O., also known as the Chemical Control Order for Lead and Lead Compounds (hereinafter referred to as the CCO), was promulgated on December 23, 2013.

DENR A.O. 1992-29²⁰, which outlines the Implementing Rules and Regulations of Republic Act 6969²¹ (Toxic Substances and Hazardous and Nuclear Wastes Act) and DENR. A.O. 1998-58,²² which specifies lead and lead compounds among the country's Priority Chemicals List (PCL), provide the legal basis for the issuance of the CCO. As per the Environmental Management Bureau (EMB), lead and lead compounds have the highest registration among the PCL chemicals from 2008 to 2011.

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

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

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

The CCO applies to importers, distributors, manufacturers, industrial users, recyclers as well as waste service providers such as transporters, treaters and disposers. It strictly prohibits the use of lead and lead compounds in the production of packaging for food and drink, fuel additives, water pipes, toys, school supplies, cosmetics, and paints.

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

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

The Department of Education issued Department Order 4, series of 2017²³ requiring the mandatory use of lead safe paints in all preparatory, elementary and secondary schools. It states: "The use of independently certified lead-safe paints/coatings shall be mandatory to all painting and/or repainting works of: school facilities (buildings, amenities, other structures), furniture, fixtures, learning materials, and tools and equipment." The Department had previously issued Memorandum 85, series of 2016[40]



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stating “the use of lead-free paints in schools must be observed at all times, especially during the conduct of activities related to Brigada Eskwela and other preparations for the opening of classes.”

The Department of Social Work and Development (DSWD) issued a memorandum requiring the use of lead safe paints as a mandatory requirement in facilities. Lead in Solvent-Based Paints for Home Use in the Philippines (October 2017) 21 catering to disadvantaged and vulnerable sectors. According to the memorandum, “the (DSWD) Standards Bureau/Unit shall ensure compliance by all social welfare and development agencies that their residential and non-residential facilities, including furniture, fixture and equipment, are using lead-safe paints or coatings prior to licensing or re-accreditation.”

The Department of Interior and Local Government (DILG) released Memorandum Circular 2018-26²⁴ enjoining local government units to:

- “Support the phase-out of lead-containing paints and eventually reduce the hazards and risks posed by such paints to human health.”
- “Adopt a “Lead-Safe Paint Procurement Policy” to make sure LGUs only purchase and use lead-safe paints for painting jobs paid out of public funds.”
- “Ensure that the other prohibited uses of lead and lead compounds such as the ban on their use in the manufacture of school supplies, toys and other children’s products, including indoor and outdoor playground equipment, are duly observed.”
- “Carry out appropriate activities that will sensitize government personnel, as well as the general public, about lead exposure sources, symptoms and effects, and preventive measures.”
- “Support the annual observance of the UN-backed International Lead Poisoning Prevention Week of Action every last week of October of each year.”

In line with the said DILG Memorandum Circular, the City Councils of Davao City and Quezon City passed on June 5 and June 13, respectively, ordinances requiring the mandatory procurement and use of lead safe paints in publicly-funded construction, maintenance and renovation projects and activities within their geographical areas.

II. Materials and Methods:

From 25 to 27 August 2018, the EcoWaste Coalition procured a total of 75 paint brushes from 26 hardware stores and 14 home improvement centers located in the cities of Caloocan, Makati, Manila, Pasay, Pasig, Quezon, San Juan, and Taguig in Metro Manila. The paint brushes represented 58 brands and nine generic ones with prices ranging from P10 to P164.75 each. Paint brushes with painted or varnished wooden handles or markings were chosen for this study. Excluded were paint brushes with plain wood or plastic handles. Each brush was given a sample number, and information about its manufacturer and/or country of origin as shown on the label were duly recorded. The samples were screened thrice for toxic metals using a portable Olympus InnovX Delta X-Ray Fluorescence (XRF) spectrometer: first at the center part of the handle, second at the tip of the handle, and third near the ferrule. The XRF is a trouble-free “point and shoot” device that is able to rapidly analyze and quantify the heavy metal content of a sample without destroying it.

III. Results:

3.1 Summary of Results:

1. 52 of the 75 samples (69%) had total lead content above the 90 ppm threshold limit under the DENR A.O. 2013-24, or the Chemical Control Order for Lead and Lead Compounds. Lead at concentrations ranging from 121 to 22,700 ppm was found in these samples.
2. 41 of the 52 lead-containing paint brushes contained lead above 1,000 ppm; 23 had lead above 5,000 ppm; and 8 contained dangerous high concentrations of lead above 10,000 ppm. Croco paint brush registered with the highest lead concentration at 22,700 ppm.
3. 38 of the 52 paint brushes with yellow handles (73%) were decorated with lead paint in the range of 374 to 22,700 ppm.
4. Panclub was the only paint brush with a yellow handle that screened negative for lead, indicating the feasibility of applying paint with no added lead on the handle.
5. None of the 52 lead-decorated paint brushes provided lead warning on the product label. There was no precautionary statement on the label that such brushes should not be used for food preparations. None of the “unleaded” paint brushes were labeled “lead-free” or “lead-safe.”
6. Additionally, most of the paint brush samples with high concentrations of lead also screened positive for arsenic, chrome and mercury above levels of concern.

Table 1: Top 12 Paint Brushes with the Highest Lead Content

Rank	Brand	Manufacturer	Lead Content in parts per million (ppm)
1	Croco 3”	Not indicated	22,700
2	Deco 2 ½”	Not indicated	19,100
3	Hi Tech 777 3”	Not indicated	16,500
4	Ohayo 2 ½”	Not indicated	14,800
5	Cooper 2 ½”	Not indicated	12,000
6	2B 3””	Not indicated	11,300
7	Lotus 2”	Mansion Tool (USA)	11,000
8	Butterfly 1 ½”	Not indicated	10,500
9	Not indicated 1 ½”	Not indicated	8,985
10	Camel 3”	Not indicated	8,827
11	Lotus 4”	Lotus Tool Group (Philippines)	8,201
12	Majesta 2”	Not indicated	7,681

Table 2: Paint Brushes with Low or Non-Detectable Lead Content (in alphabetical order)

Brand	Manufacturer	Remarks
Ace 1 ½"	Ace	Varnished handle
Ace 1 ½"	Ace	Varnished handle
Biber 1 ½"	Not indicated	Varnished handle with black and red tip
Black Armor 1 ½"	Not indicated	Plain handle with black marking
Buffalo 2"	Not indicated	Plain handle with black marking
Creston 1 ½"	Not indicated	Red handle with gold tip
Greene 2"	Greene USA	Varnished handle
Greenfield 1"	Greenfield Tools	Varnished handle
Greenfield 3"	Not indicated	Varnished handle
KCT 3"	Not indicated	Blue painted handle
KYK 2"	KYK Tools	Varnished handle
MMT 1 ½"	Not indicated	Varnished handle with black and red tip
Panclub 4"	Not indicated	Yellow painted handle
Selleys 2"	Selleys Malaysia	Varnished handle
Silk ½"	Not indicated	Varnished handle with gold tip
Smart 1 ½"	Not indicated	Varnished handle
Sonic 3"	Not indicated	Varnished handle with gold tip
Sonipro 2"	Not indicated	Varnished with gold tip
Stallion 2"	Not indicated	Blue painted handle
Stanley 1 ½"	Stanley Tools	Varnished handle
Sterling Touch Up 2"	Sterling	Red painted handle
Suname 2 ½"	Not indicated	Plain handle with red tip
Not indicated 2"	Not indicated	Varnished handle with red tip

3.2 Comparison with Previous Studies:

The EcoWaste Coalition analyzed paint brushes for lead content in three sampling activities conducted in Metro Manila, Cebu (with Philippine Earth Justice Center) and Davao (with Kinaiyahan Foundation) prior to the promulgation of the DENR A.O. 2013-24, or the Chemical Control Order for Lead and Lead Compounds, in December 2013.

1. Metro Manila, April 2013²⁵: Lead above 90 ppm was discovered in 22 out of 25 paint brush samples, costing P12 to P102 each, that were obtained from 12 hardware and home improvement stores. A Hi Tech paint brush with yellow painted wooden handle had the highest lead content at 17,400. Hi Tech (black plastic handle), Mansion and Stanley paint brushes showed no detectable lead.

2. Cebu, July 2013²⁶: Lead exceeding the 90 ppm limit was detected in 16 of the 19 paint brush samples procured from six hardware stores for P5 to P119 each. A Lotus paint brush had the highest lead content at 10,500 ppm. The three samples of Mayon paint brushes passed the lead paint limit.

3. Davao, July 2013²⁷: Lead above 90 ppm was found in 33 out of 40 paint brush samples that were purchased for P8 to P95 each from hardware stores located at Center Point Plaza, Gaisano Mall, NCCC Mall, Robinsons Abreeza Mall, SM City Davao, Victoria Plaza Mall and Unitop General Merchandise Inc. A Camel paint brush had the highest lead content at 8,609 ppm. Lead was not detected on the seven samples of Greenfield, KYK and Stanley paint brushes.

IV. Discussion:

The presence of lead on the painted handles of paint brushes that were analyzed in this study points to an obvious breach of the country's landmark regulation banning lead in paints. XRF screening results show that many paint brushes, particularly those with yellow decorated handles, had lead content above the regulatory limit of 90 ppm. With the completion on 31 December 2016 of the government-imposed phase-out on lead-added architectural, household and decorative paints, it would only be logical that painting implements such as brushes are also devoid of lead. The use of such paint brushes may result in the contamination of a coating material that does not contain lead due to the flaking of the paint on the handle that normally happens with repeated use.

Also, paint brushes are used for non-painting related purposes at home, office or school. For example, some people may use paint brushes to remove dust and dirt from laptop keyboard, sewing machine, and other equipment. Frequent use will cause the paint to break or crumble into dust posing lead exposure risk through the ingestion or inhalation of lead-containing paint chip or dust.

As current regulations do not classify used lead-decorated paint brushes as “hazardous waste” or “special waste,” these brushes are typically disposed of like any ordinary discard. The lack of a collection system for household hazardous waste does not encourage generators to keep such waste segregated from regular trash.

But what may be more disturbing in the Philippine context is the typical use of paint brushes in various food preparations, particularly for street food. Brushes which are meant for applying paint are also used for applying basting sauce on barbecued pork, “walkman” (pig’s ear), “betamax” (chicken blood), “helmet” (chicken head), “isaw” (chicken intestine) and other popular grilled street food. Brushes are also used for rubbing butter or margarine on corn on the cob, as well as Christmas holiday staples such as “bibingka” (rice cake) and “puto bumbong” (steamed sticky rice). It will not be unusual for small-scale bakeshops to use them as pastry brushes.

The use of paint brushes, which are non-food grade utensils, may pose a lead contamination risk, especially when the lead painted handle has started to crumble due to repeated use. The chalking, chipping or peeling lead paint on the handle of these brushes may get onto the sauce, butter, glaze or oil that is applied on food and into someone’s mouth. This raises the possibility for lead poisoning to occur due to the ingestion of lead contaminated food. A review of the toxicity of lead states that “lead is thought to be quickly absorbed in the blood stream and is believed to have adverse effects on certain organ systems like the central nervous system, the cardiovascular system, kidneys, and the immune system.”²⁸

While we have yet to come across a published study linking lead contamination of food with the use of brushes with lead painted handles, food preparers are advised to err on the side of caution and only use lead-safe devices. One precaution that can be taken by food preparers is not to use paint brushes, and to use food grade basting brushes or mops. If food grade basting or pastry are not affordable or available, ingenious food preparers can opt for DIY (do-it-yourself) mops made out of banana, lemon grass or pandan leaves.



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V. Recommendations:

As the eradication of lead exposure at its source is the single most effective action against childhood as well as adult lead poisoning, the EcoWaste Coalition recommends the following steps:

For Paint Brush Manufacturers:

- Withdraw from the market paint brushes decorated with lead paint.
- Ensure that only lead-safe paints are used for decorating paint brushes.
- Provide adequate product labeling information, including its lead content.
- Include a precautionary warning on the label stating that paint brushes may not be suitable for food-related applications.

For Hardware Stores, Home Improvement Centers and Other Retailers:

- Desist from selling lead-containing paint brushes.
- Demand lead-safe paint brushes from suppliers.
- Put up a warning sign on paint brush rack or shelf: "Safety First: Not Suitable for Food Preparation."
- For Consumers:
 - Ask for lead-safe paints, as well as lead-safe paint brushes, from your favorite store.
 - Use hygienic food grade basting mops and refrain from using paint brushes.

For the Government:

- Educate the public about the risks of misusing paint brushes for food purposes.
- Prohibit the use of paint brushes for food preparation as a precaution against lead contamination.
- Enforce the ban on lead-containing decorative paints in the production of paint brushes and other home improvement products.

VI. Conclusion:

This study confirms that paint brushes with high concentrations of lead attributable to the use of lead paint on the handle are being sold in the market despite the ban on lead-containing decorative paints, which took effect on 31 December 2016. The same study further confirms the availability of paint brushes that pose no lead paint hazard. As the nation pursues the elimination of lead paint in line with the Chemical Control Order for Lead and Lead Compounds and the 2020 goal of the Global Alliance to Eliminate Lead Paint, it is essential that materials used for painting works such as paint brushes are certified lead-safe. The misapplication of paint brushes for food preparations, particularly for spreading barbecue sauce, butter, glaze or oil on food, makes it all the more urgent for paint brush makers, hardware stores and home improvement centers to ensure that only lead-safe paint brushes are made available to consumers, while national and local government authorities take steps to halt such misuse of paint brushes for food purposes.

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