Dedicated for Lead Safe and Earthquake Resilience Reconstruction of Nepal

NATIONAL REPORT
LEAD IN NEW ENAMEL HOUSEHOLD PAINTS IN NEPAL
JUNE 2015

CEPHED

Center for Public Health
and Environmental Development

June 2015

EUROPEAN UNION

IPEN
a toxics-free future

NATIONAL REPORT

LEAD IN NEW ENAMEL HOUSEHOLD PAINTS IN NEPAL

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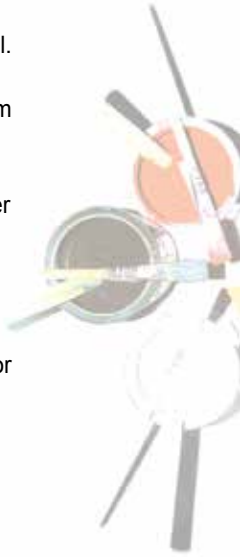

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This booklet was produced as part of the Asian Lead Paint Elimination Project. The Asian Lead Paint Elimination Project was established to eliminate lead in paint and raise widespread awareness among business entrepreneurs and consumers about the adverse 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 1.5 billion US Dollars (NRs. 1.5 Kharba). While this report has been produced with the assistance of the European Union, its contents are the sole responsibility of Center for Public Health and Environmental Development (CEPHED) 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.

Center for Public Health and Environmental Development (CEPHED) is an environmental NGO established in the year 2004, by a group of activist and experienced people from medical, environment and public health sectors. CEPHED's focus is to serve Nepalese people and communities in the field of public health and environment. CEPHED has adopted the vision of connecting people to the science and technology for healthy leaving and environmental safety and providing access to new scientific knowledge, technology and safety measures from environment and public health sectors through research, coordination, capacity building and policy dialogue.

CEPHED works with groups and organizations around the country in order to help to bring experiences from local communities to the attention of concerned authorities' and develop meaningful and sustainable solutions. From the very beginning of its establishment, CEPHED has been engaged mainly on research, awareness raising, capacity building, policy development especially in the areas of chemical management, pesticides, obsolete pesticides, healthcare waste, persistent organic pollutants (POPs), heavy metals like mercury, lead and cadmium, toxic children toys, lead in paints, lead in household and school dust, lead in artificial jewelry, lead in lipsticks, mercury in cosmetic-skin whitening creams, mercury in hospital environment, mercury in aquatic animals (fish), and mercury in CFLs, mercury in human bodies (dentists, nurses, fishermen, and women of child bearing age).

With its growing interest and engagement with various environmental issues of national and international importance, CEPHED has become an active participating organization in several global networks working in the area of public health, environment and a toxic-free future. CEPHED is member organization of Toxics Link, IPEN, Global Alliance for Incinerator Alternatives (GAIA), Environment Law Alliance Worldwide (Elaw), Healthcare Without Harm (HCWH), Collaborative on Health and the Environment (CHE), Zero Mercury Working Group (ZMWG)/EEB, World Alliance for Mercury Free Dentistry (WAMFD), Asian Center for Environmental Health, International Asbestos Ban Secretariat etc.

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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 in countries with economies in transition. 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. In every country where there was no law or regulation prohibiting the use of lead in paints, the paints had high and often dangerously high, lead contents.

This 2015 National Report on Lead in New Enamel Households in Nepal presents new data on the lead content of decorative enamel paints that are offered for sale in the Nepalese market. This is the fourth time that Center for Public Health and Environmental Development has analyzed paints sold in Nepal for their lead content.

The first study, Study of Lead in Paint in Nepal, was conducted in 2010 sampled 24 paints from 10 national, 7 multinational and 7 international paint companies. Major findings of the study were

- Total 85 percent (11 out of 13) enamel samples were found to have lead content, ranging from a minimum of 4 parts per million (ppm, dry weight) to a maximum of 74000 ppm i.e. 822 times higher than standard gazette by Nepal of 90 ppm.
- All 6 enamel paints with the Nepalese Standard marked paints contain high amount of lead i.e. higher than 90 ppm ranging from 2071 ppm (23 times higher than standard) to 73966 ppm (822 times higher than standard) ppm.

The second study, Double Standard: Investigating Lead Content in Leading Enamel Paint Brands in Asia, was conducted in late 2010 and early 2011. In this study, paint samples from 27 common enamel paint brands were analyzed for lead content (12 from Nepal, 9 from India and 6 from Bangladesh). Major findings included:

- The multinational companies sold paints in Nepal and Bangladesh with higher lead levels than in India

A third study, Lead in Nepal's New Enamel Household Paints, analyzed samples from 49 cans of enamel decorative paints sold in Nepal, was released in 2013. Study findings included:

- 71 percent of the sampled paint contained lead levels above the internationally accepted standard of 90 ppm and would not be permitted for sale in the many developed countries. These paints also exceed a newly enacted (December 2014) Nepalese standard of 90 ppm
- Green, red, yellow and blue color paints are the most likely to contain dangerously high levels of lead. More than half of the brands (57 percent, 21 out of 12 brands) sell paints lead levels above 10,000 ppm.

In addition to new data on lead in paint, the current report (fourth study) 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 proposes action steps by different stakeholders to protect children and others from lead paint and lead dust.

The Non-Governmental Organization LEADERS in Nepal conducted a study of lead content in 75 paints available on the Nepalese market in 2013, conducted under UNEP Quick Start Program and in collaboration of the US Non-Governmental Organization OK International. The results from this study was used to complement the results from the 2013 CEPHED study in selecting paints for the 2015 study, and assessing the change in lead levels between 2013 and 2015. Out of 75 solvent-based enamel paints, 76 percent (57 paints) contained lead at concentration greater than 90 ppm. Lead concentration in these 57 paints ranged from 510 ppm up to 200,000 ppm.

[1] 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 lists 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 Nepal, the Government of Nepal gazette a new mandatory lead paint standard of 90 ppm in December 2014 to protect children's health by eliminating hazardous level of lead in paint. It was promulgated through notification in Nepal Gazette (Khand 64, Number 30, Part 5, Notice No.3 dated December 22, 2014) by Government of Nepal, Ministry of Science, Technology and Environment as per the Rule 15 of Environment Protection Regulation 1997 and takes effect after 181 days (June 20, 2015).

In 2014-15, Center for Public Health and Environmental Development (CEPHED) purchased a total of 87 cans of solvent-based enamel decorative paint from stores in Kathmandu, Lalitpur Banepa, Biratnagar Birgunj, Butwal and Pokhara in Nepal. The paints were from 35 brands, representing 27 different paint companies. The paints were selected because 1) they were shown to contain lead above 90 ppm in CEPHED's 2013 study, Lead in Nepal's New Enamel Household Paints , or LEADERS´s 2013-2014 study, Lead in New Paints in Nepal or 2) because they had not previously been analyzed for their total lead content. Paints shown to have a lead content below 90 ppm in earlier studies were not included in this study. All paints were analyzed by an accredited laboratory in Europe for their total lead content, based on dry weight of the paint.

This is the fourth study CEPHED has released about the lead content of new decorative enamel paints in Nepal.

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.

Summary of Results of Paint Lead Levels in Nepal

Nearly 9 out 10 (89 percent) of all paints in the study exceed Nepal's recently gazette standard of 90 ppm and will be illegal after June 20, when the new law takes effect. The highest level detected was 124,000 ppm, 1,378 times greater than 90 ppm standard.

There has been only a small improvement in lead reduction in paints since CEPHED last tested paints in 2013. Between 2013 and 2015 the percentage of paints with lead concentrations above 90 ppm fell only 4 percentage points, from 95 percent (55 of 58 paints) to 91 percent of the paints (53 of 58 paints). The percentage of paints with lead concentrations greater than 10,000 ppm also dropped only a small amount, from 50 percent (29 of 58 paints) to 45 percent (26 of 58 paints) in 2015.

A substantial number of paint manufacturers will need to need to shift to lead safe paints in order to be compliant with the new law. The vast majority (93 percent) of paint companies included in this study produces and sells paint with a lead content above the new Nepalese standard of 90 ppm

and nearly three quarters (74 percent) of the paint companies sell paints with dangerously high lead levels above 10,000 ppm.

Green, yellow and red color paints are the most likely to contain dangerously high levels of lead above 10,000 ppm. 100 percent (10 out of 10) of green, Ninety-five percent of yellow (18 out of 19 paints) and 78 percent of red color (14 out of 18 paints contained lead levels higher than 90 ppm.

Paint can labels with Nepal Standard Mark can be Misleading

Five major paint manufacturing companies representing 70 percent of market share (3 multinational companies viz Asian Paints, Brger Jonson and Nicolson paints, Kansai Nepal with production units in Nepal and 2 International paints viz: ICI Dulux and Nerolac with production units outside of Nepal) sell their paint product with labels that indicate **"No Added Lead"**. Though the logos are self-claimed and are not independently verified, paint samples from these companies were found to have lead level within the permissible standard of 90 ppm.

On the other hand, nine brands that carry the Nepal Standard (NS) mark, provided by Nepal Bureau of Standard and Metrology (NBSM), were found to have lead content higher than the permissible standard. At the moment, it become mandatory for the paint companies with **NS mark** to have lead content within the mandatory standard of 90 ppm set by Government of Nepal along with its effective date.

Conclusion and Recommendation

With the continuous advocacy from CEPHED and technical support to Government of Nepal, the Ministry of Science, Technology and Environment (MOSTE) has now a gazette standard of 90 ppm lead in paint. Similarly, Department of Education published a public notice via leading newspaper that it will only use paints complying the Government of Nepal's 90 ppm standard in , private and public school buildings and furniture's throughout the country. 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.

On the basis of this study, there are 23 of 27 small and medium sized paint companies that continue to produce paint with lead concentrations higher than permissible standard limit of 90 ppm. However, at least one paint samples of the five of these small and medium paint companies found to be contain lead less than 90 ppm shows their efforts towards complying the standard. These small and medium paint companies make up approximately 20-30 percent of Nepal's total paint market. These producers often face special barriers in shifting to low lead products and may require additional technical information, better access to suppliers of non-leaded paint ingredients and other types of help in re-formulating their products.

Key Recommendations:

CEPHED recommends the following actions to continue the efforts to protect Nepalese children:

Government should:

- Inform all government agencies, paint companies, importers, dealers, retailers and the general public about the newly enacted mandatory 90 ppm lead paint and labeling standard.
- Establish a strong and efficient monitoring mechanism to ensure compliance with the 90 ppm standard by paint manufacturers.
- Permit the use of "NS Mark " only for the paints in compliance with government standard of 90 ppm.
- Monitor the proper labeling of paints, including lead content and other compounds; date of manufacture and date of expiry; and information that alerts users to the hazards of lead-contaminated dust when previously painted surfaces are scraped or sanded in preparation for repainting.
- Updated record keeping of imported and exported and other hazardous chemicals and items.
- Provide a mandatory circular or notification to all the schools, colleges in both the public and private sectors to only use non-leaded paints and/or paint complying the government lead paint standard of 90 ppm and to use precautions to reduce exposures to lead dust that can be created in preparing previously-painted surfaces for repainting.

- Immediately implement the Green Public Procurement Policy (GPPP), i.e., only purchase non-leaded paints, and effectively implement it.

Paint Industry, Nepal Paint Manufacturers Associations and Chamber of Commerce Organizations

- Immediately comply with the 90 ppm lead paint standard by discontinuing the use of leaded driers, leaded pigments, leaded fillers and other ingredients that contribute to high lead levels and shift to non-lead substitutes.
- Provide support to smaller manufacturers in shifting to paint production capable of meeting the mandatory, 90 ppm lead paint standard.
- Provide training on the lead-safe precautions needed when applying new paints to previously painted surfaces.
- Provide a label in cans to indicate the hazards of lead exposure and the potential for creating lead dust hazards when using the paint on previously painted surfaces.

Paints Dealers and Retailers

- Only import, sell, and distribute paints complying with the government's mandatory, 90 ppm lead paint standard.
- Provide information to consumers on the health hazards of lead and in particular lead dust hazards.

Consumers

- Be aware of the hazards of lead exposure and precautions to take.
- Ask for and buy for paints with low lead content paints can with NO ADDED LEAD logos. Beware of companies making false low lead claims.

BACKGROUND

Health and Economic Impact of Lead Exposure

Children are exposed to lead from paint when 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.[3]

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.[4]

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.[5]

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.[6] The younger the child, the more harmful lead can be, and children with nutritional deficiencies absorb ingested lead at an increased rate.[7] The human fetus is the most vulnerable, and a pregnant woman can transfer lead that has accumulated in her body to her developing child.[8] Lead is also transferred through breast milk when lead is present in a nursing mother.[9]

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.[10]

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.[11]

According to the World Health Organization (WHO),"Lead has no essential role in the human body, and lead poisoning accounts for about 0.6% of the global burden of disease."[12] 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.[13]

In recent years, medical researchers have been documenting significant health impacts in children from lower and lower levels of lead exposure.[14,15] **According to WHO, "There is no known safe level of exposure to lead."**[16]

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.[17] 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.[18] 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[b] per year.[19] The study considered the neuro-developmental 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% of Gross Domestic Product (GDP)
- Latin America and the Caribbean: $142.3 billion of economic loss, or 2.04% of GDP
- Asia: $699.9 billion of economic loss, or 1.88% of GDP [or 71.6% (699.9/977)of total losses]
- **Nepal: 1.5 billion International dollors or 4% of the Nepal's GDP an amount that is likely much higher than total revenue from lead related business as a whole in Nepal.**

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.[20]

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

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

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.

PAINT MARKET AND REGULATORY FRAMEWORK IN NEPAL

Paint Market in Nepal

In recent years, growing financial capacity among the public has led to increased renovation and decoration activities and greater paint sales. Until 2012, media agencies reported an annual growth rate in paint sales of 35 percent.[21] As of 2015, approximately 100 paint industries were registered as small and medium industries. Out of those registered industries, approximately 40 paint industries are currently operating in Nepal[c]. The majority of these are small producers with a relatively small share in local market. The four major paint manufacturing industries selling enamel paint in Nepal are Asian Paints, Berger Paints, Pashupati Paints and Kansai Nepal paints (previously marketed as Nepal Shalimar Paints).

According to claims from respective paint manufacturing industries, Asian Paints is the leading paint manufacturer in terms of domestic market share with 40 percent followed by Berger Jenson & Nicholson (27 percent), Pashupati Paints (20 percent), and Kansai Nepal Paints (13 percent). However, the actual numbers are somewhat lower since additional paint manufacturers also are active on the Nepalese paint market and are estimated to have a total of 20 – 30 % share of the market.[22]

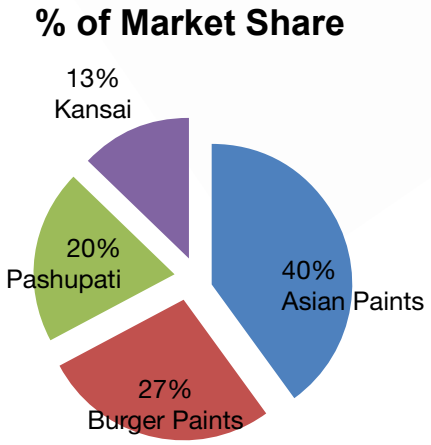


Figure 1 Market Share of the Paint Companies (As per claim)

There also are numerous untracked and unidentified paint products locally available in the Nepalese market. Because these paints are primarily sold in local level markets, their market share is hard to analyze. In addition, there are several paint products being imported from various countries such as USA, Singapore, Thailand, India (local paints), and China, etc. and often are not calculated in formal market share analyses.

From the data obtained from Nepal Rastra Bank for fiscal year 2012, paint imported from India alone was worth 886 million Nepalese Rupees. Small and medium-sized paint manufacturers (SMEs) primarily serve local markets, which makes their percentage of market share hard to obtain. Among the different types of paint sold, a fifth are enamel decorative paints.

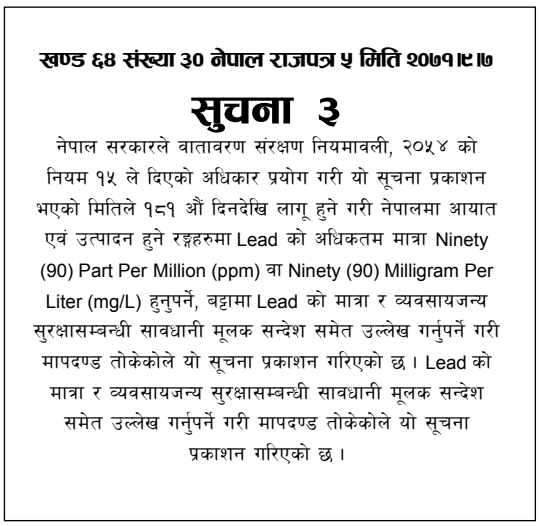
c Source: Interaction with Nepal Paint Manufacturer's Association 25th March 2013 , Department of Small and Cottage Industries as well as various media sources)

Lead Paint Regulatory Framework

The Government of Nepal gazetted a mandatory, 90 ppm lead paint standard to protect children's health by eliminating hazardous level of lead in paint. It was promulgated through notification in Nepal Gazette (Khand 64, Number 30, Part 5, Notice No.3 dated December 22, 2014) by Government of Nepal, Ministry of Science, Technology and Environment (MOSTE) as per the Rule 15 of Environment Protection Regulation 1997. The standard will take effect after 181 days (June 20, 2015) of the date of gazette.

Along with the standard, Government of Nepal also made mandatory precautionary labeling related to occupational exposure and amount of lead on the paint can itself.

On the basis of 90 ppm standard, Department of Education issued a public notice on lead paint on the 15th March, 2015. According to notice, "all private and public schools must use non-leaded paints or the paints that comply with government standard of 90 ppm lead during their repainting and renovating activities on school furniture and buildings."



खण्ड ६४ संख्या ३० नेपाल राजपत्र ५ मिति २०७१।९।७

सुचना ३

नेपाल सरकारले वातावरण संरक्षण नियमावली, २०५४ को नियम १५ ले दिएको अधिकार प्रयोग गरी यो सूचना प्रकाशन भएको मितिले १८१ औं दिनदेखि लागू हुने गरी नेपालमा आयात एवं उत्पादन हुने रङ्गहरुमा Lead को अधिकतम मात्रा Ninety (90) Part Per Million (ppm) वा Ninety (90) Milligram Per Liter (mg/L) हुनुपर्ने, बट्टामा Lead को मात्रा र व्यवसायजन्य सुरक्षासम्बन्धी सावधानी मूलक सन्देश समेत उल्लेख गर्नुपर्ने गरी मापदण्ड तोकेकोले यो सूचना प्रकाशन गरिएको छ। Lead को मात्रा र व्यवसायजन्य सुरक्षासम्बन्धी सावधानी मूलक सन्देश समेत उल्लेख गर्नुपर्ने गरी मापदण्ड तोकेकोले यो सूचना प्रकाशन गरिएको छ।

Figure 2 Gazette Standard of 90 ppm lead in paint

Nepal Gazette

Published by Government of Nepal

Part 5

Government of Nepal

Ministry of Science, Technology and Environment

Notice No. 3

(Part 64, Number 30, Nepal Gazette, Part 5, dated December 22, 2014)

In exercise of the power conferred by Rule 15 of the Environment Protection Rules, 1997 shall come into effect from 181 days from the date of publication of the notice by the Government of Nepal has set the standard limiting maximum Lead in paints Imported and produced in Nepal to Ninety (90) Parts Per Million (ppm) or Ninety (90) Milligram Per Liter (mg/L), label paints can with lead content and protective precautionary message to prevent the occupational exposure by the publication of the notice.

With permission

Mahendra Man Gurung

Acting Secretary, Government of Nepal

Figure 3 Gazette Standard of 90 ppm lead in paint

गोरखापत्र
www.gorkhapatraonline.com

२०७१ साल चैत १ गते आइतवार
2015 March 15 Sunday

नेपाल सरकार
शिक्षा मन्त्रालय
शिक्षा विभाग

विद्यालय शिक्षासम्बन्धी गतिविधि-१३१

घर तथा विद्यालय पूर्वाधारहरू रङ्गाउदा नेपाल सरकारद्वारा तोकिएको लेडको मापदण्ड ९० पि.पि.एम. अनूसारको रङ्गहरू मात्र प्रयोग गरौ ।

सबै उमेरका मानिसहरु एवं खासगरी बालबालिकाहरु लेड (सिसा) को सम्पर्कमा आएको खण्डमा पढ्ने लेख्ने क्षमता घट्न सक्ने, आनीबानी तथा हाउभाउमा परिवर्तन आउने, स्नायू प्रणाली, प्रजनन् प्रणालीमा गडबडी, मानसिक सन्तुलन बिग्रन सक्ने, आदि हुनसक्दछ। लेडले बालबालिकाको शारीरिक, मानसिक तथा बौद्धिक विकासमा निकै नकारात्मक प्रभाव पुऱ्याउँदछ। सर्वसाधारणको घर तथा विद्यालय भवन, फर्निचर, खेलौना, खेलसामग्री, खेलमैदान तथा अन्य भौतिक पूर्वाधारहरु रङ्गाउने र ङ्गहरुमा पाइने लेड (सिसा) को असरलाई न्यूनीकरण गर्नका निम्ति **नेपाल सरकारद्वारा रङ्गमा लेडको मापदण्ड ९० पि.पि.एम. तोकिएको हुँदा** सम्पूर्ण सामुदायिक तथा संस्थागत विद्यालयहरुले **बजारमा उपलब्ध लेड नमिसाइएको रङ्गहरु मात्र खरिद गरी प्रयोग गर्नं गराउनु** हुन सबै सरोकारवालाको जानकारीको लागि यो सूचना प्रकाशन गरिएको छ।

Figure 4 Public Notice from Department of Education, Ministry of Education, Government of Nepal.

MATERIALS AND METHODS

From November 2014 to Jan 2015, Center for Public Health and Environmental Development (CEPHED) purchased 87 cans of enamel decorative paints from various stores from, Kathmandu, Lalitpur, Banepa, Butwal, Birgunj, Biratnagar and Pokhara market. These paint samples from 34 different paint products were produced by 27 paint manufacturing industries. In most cases, for most of the brands, CEPHED selected one white paint and one or more bright-colored paints such as red, orange or yellow. 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, country where manufactured, purchase details, date manufactured as provided on the label of the paint can was recorded. The formats used for date of manufacturer 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 “bright red.” Colors were recorded as provided on the can. For the red and yellow paints the protocol called for obtaining “bright” or “strong” red and yellow paints 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 paintbrushes and stirring utensils made from untreated wood sticks were assembled and shipped to the CEPHED by the staff of the IPEN partner NGO, Arnika, in the Czech Republic.

Each can of paint was thoroughly stirred and was subsequently applied onto individually numbered triplicates of untreated wood pieces using different unused single-use paintbrushes by the staff of Center for Public Health and Environmental Development.

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 resaleable plastic bags and shipped to an ELPAT (Environmental Lead Proficiency Analytical Testing program) accredited lab 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 as appropriate for the purpose.[23, 24]

Figure 5 Paints Samples

Figure 6 Paint sample and indivisual brush, stirrer and wooden pieces.

Figure 7 Preparing paint samples by painting on wooden sticks

Figure 8 Drying the Paint samples

RESULTS AND FINDINGS

A total of 87 cans of new enamel decorative paints were purchased from markets of Kathmandu, Lalitpur, Banepa, Butwal, Birgunj, Biratnagar and Pokhara in Nepal and analyzed for their lead content. Results are given in parts per million (ppm) lead, based on dry weight of the paint.

Dangerously high lead concentrations above 10,000 ppm were found in 44 percent (38 of the 87) enamel paints, 83 percent (72 of 87) of the paints had lead concentrations more than 600 ppm whereas only 11 percent (10 of 87) paint samples had lead level below the permissible standard of 90 ppm.

With the comparison to the permissible standard of 90 ppm lead in paint, 89 percent of the paints had lead concentrations above 90 ppm and would not be permitted for sale in the Nepalese market as of June 20, 2015. In addition 83 percent had lead concentrations above 600 ppm as well as 44 percent of paint samples even contain more than 10,000 ppm and would not be permitted for sale in most industrialized countries.

The highest concentration detected was 124000 ppm, which is 1,378 times more than the Nepal gazetted standard of 90 ppm.

Lead Concentration by Paint Companies/Brand

Almost every paint companies (93 percent) in Nepal sell paints containing lead above the Nepal gazette standard of 90 ppm, and nearly three quarter (74 percent, 20 out of 27 brand) sell paints with dangerously high levels above 10,000 ppm.

Study analyzed the samples from brand name as well as from company name perspective. The study included 87 paints from 35 paint brands representing 27 paint manufacturing industries. Among the paint samples from 35 brands, 94 percent (33 out of 35) of paint brand had lead contamination higher than 90 ppm This means only 6 percent (2 of 35) of paint brands had less than 90 ppm lead content. Similarly, 89 percent (31 out of 35) and 66 percent (23 out of 35) paint brand had lead contamination higher than 600 ppm and 10000 respectively. Minimum lead contamination of <10 ppm was from ICI Dulux whereas maximum lead contamination of 124000 was from Reliance Paints.

89 percentage of samples (77 out of 87) had lead level higher than 90 ppm, 83 percent (72 out of 87) had lead level higher than 600 ppm and 44 percent (38 out of 87) had lead level higher than 10,000 ppm.

Among the paint companies, 93 percent (25 of 27 companies), 85 percent (23 of 27 companies) and 74 percent (20 of 27 companies) of paint companies produced at least one paint with a lead content higher than 90 ppm, 600 ppm and 10,000 ppm respectively.

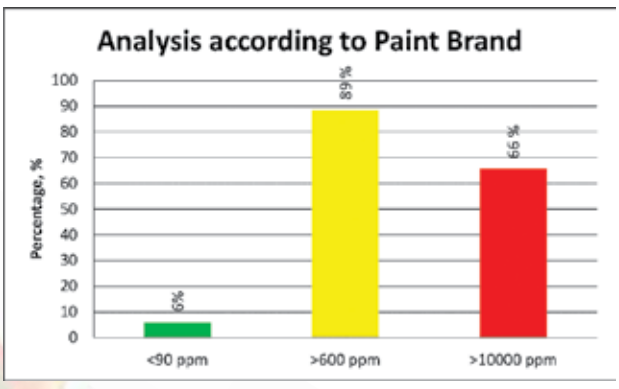


Figure 9 Lead concentration in paint samples, On Brand Basis

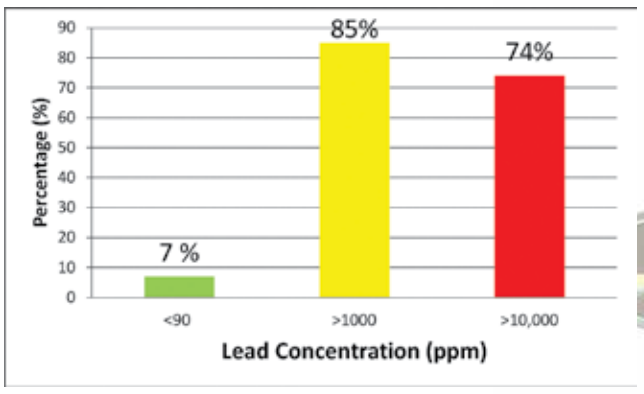


Figure 10 Distribution of lead concentration per manufacturing company

Table 1. Distribution of lead concentration per brand of all 87 paints analyzed in 2015

Company Name	Brand Name	Number of Samples	Number of Samples ≥ 90 ppm Lead	Number of Samples ≥ 600 ppm Lead	Number of Samples ≥10,000 ppm Lead	Minimum lead concentration (ppm)	Maximunm lead concentration (ppm)
Apollo	Apollo	3	2	2	1	88	21,000
	Apollolite	3	3	2	1	96	45,000
Ashoka Paints and Chemicals	Nicolson	1 (chocolate)	1	0	0	580	580
Baba	Baba	5	5	5	2	2,075	48,000
Dalmia	Dalmia	3	3	3	3	41,000	76,000
G7	Lalupate	2 (brown, green)	2	2	2	19,300	33,000
	Sinelac	1 (white)	1	1	0	6,200	6,200
	G7	1 (white)	1	1	0	2,567	2,567
Gaurishankar	Gauri	3	2	2	0	73	3,300
Gupta Paints	Deluxe	2 (green, yellow)	2	2	2	17,400	44,000
Jasmine Paints	Jasmine	5	5	5	3	3,306	69,000
Jenish Paints	Jenish	4	3	3	2	14	41,000
LG Paint Industries	LG	1 (white)	1	1	0	920	920
Mahalaxmi Pulverising Udhyog	Colorlite	4	4	4	1	1,339	31,000
Nandani Paints	Kristal	3	3	2	2	310	33,000
Nepal Paints	Nepal Paints	4	4	4	2	2,163	32,360
Nepal Shalimar Paints	Shalimar	1 (white)	1	1	0	2,632	2,632
	Goldlac	1 (yellow)	1	1	1	21,000	21,000
Prakash Paint Industries	Goldlac	1 (blue)	1	1	0	930	930
Pashupati Paints	Danfe	5	5	5	2	2,600	64,000
	Nepolite	1 (red)	1	1	1	12,800	12,800
Rakesh and Company	Micolite	2 (white, red)	2	2	1	7,110	31,000
Ratee Paints	Mayur	4	4	4	2	2,426	51,000
Red Belt Paint	American Red Belt	1 (yellow)	1	1	1	60,000	60,000
Reliance	Reliance	5	5	5	3	2,453	12,4000
RCI	Nerolac	2 (red, white)	1	1	1	16	23,650
	Superlac	3	3	3	2	2,789	32,000
Shalimar Paints	Shalimar	4	2	1	1	21	78,000
Tirupati Balaji	Ruby Deluxe	1 (white)	1	1	0	2,308	2,308
	Pearl	1 (brown)	1	1	1	12,500	12,500
	Galaxy	1 (grey)	1	1	0	6,300	6,300
Yeti Paints	Yeti Paints	4	4	4	1	3,657	34,000
ICI Dulux	Dulux	1 (red)	0	0	0	<10	<10
Berger Jenson and Nicholson	Brolac	1 (red)	0	0	0	43	43
Kansai Nepal	Nerolac	3	1	0	0	12	95
No. of Company: 27	No. of Brand: 35	87	77	72	38		
Percentage (%)		**100 %**	**89%**	**83%**	**44%**		

Lead Concentrations in 2015 compared to 2013 study conducted by CEPHED and LEADERS Nepal

The present study included 58 paint samples (on color basis) from 18 paint manufacturers that were also included in the studies conducted by CEPHED and LEADRS in 2013. With the comparison it was tried to determine whether the situation is improving or whether there is need for interventions based on the findings of this study. Though it was tried to analyze each single brand/color with lead concentrations above 90 ppm as indicated in the 2013 studies, it was not possible due to unavailability of some paint cans from small industries of same color in market.

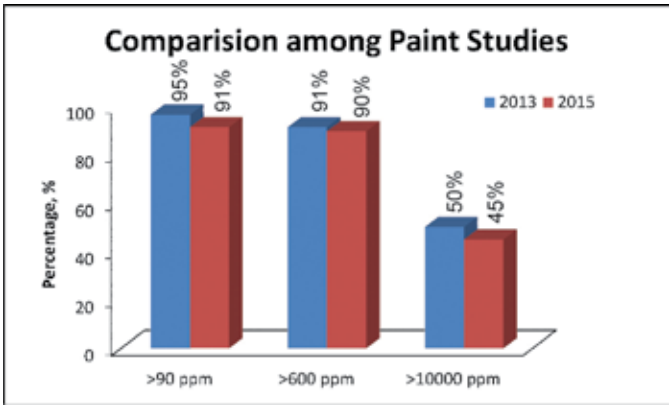


Figure 11 Distribution of Lead Concentrations of Paints in 2013 and 2015

Among the compared 58 paint samples, it shows only slight improvement in terms of lead contamination in paint samples. In 2013 study, 95 percent of the paints (55 of 58 paints) had lead contamination higher than acceptable limit 90 ppm which is reduced to 91 percent (53 of 58 paints) in 2015. Similarly, in 2013 study, 50 percent of paints (29 of 58 paints) had lead concentration greater than 10000 ppm which is reduced to 45 percent (26 of 58 paints) in 2015.

Table 2. Comparison of Lead Concentrations in 2013 and 2015

Company/Brand	Colour	Lead Concentration (ppm)	
		2013 Study	2015 Study
Apollo Paints	Blue	1200	1383
Apollo Paints	White	1630	88
Apollo Paints	Red	22000	21000
Apollo Paints	Yellow	64000	3500
Baba Paints	Black	6700	3846
Baba Paints	White	6100	2075
Baba Paints	Red	6700	28010
Baba Paints	Green	69000	6400
Baba Paints	Yellow	87000	48000
Berger Jenson and Nicholson	Red	11000	43
Dalmia Paints and Chemical Industries	Green	32000	76000
Dalmia Paints and Chemical Industries	Red	53000	41000
G7	Brown	19000	19300
G7	Red	30000	6200
G7	Green	37000	33000
G7	White	2400	2567
Gupta Paint	Yellow	62000	44000
Gupta Paint	Green	68000	17400
Jasmine Paints	Black	190	3306
Jasmine Paints	Green	3000	13780
Jasmine Paints	Red	42000	37000
Mahalaxmi Pulverising Udhyog	White	19	1339
Mahalaxmi Pulverising Udhyog	Green	28000	31000
Mahalaxmi Pulverising Udhyog	Red	60000	3300
Mahalaxmi Pulverising Udhyog	Yellow	62000	9600
Nepal Paints	Blue	420	2163
Nepal Paints	White	2800	2937
Nepal Paints	Red	4300	32360
Nepal Paints	Yellow	66000	15600
Nepal Shalimar Paints	White	2900	2632
Nepal Shalimar Paints	Yellow	33000	21000
Pashupati Paints	Brown	2000	7586

This is success! Lead compounds are not being intentionally used and the sample meets the new standard.

Indicates that while lead is still being used for some purposes, lead pigments do not appear to being used from June 20, 2015.

This is a success! Lead compounds are not being intentionally used and the sample meets the new standard.

Pashupati Paints	White	169	2600
Pashupati Paints	Yellow	130000	64000
Pashupati Paints	Red	5000	12800
Pashupati Paints	Green	56000	35000
Rakesh and Company	White	3200	7110
Ratee Paints	Black	1540	3194
Ratee Paints	White	3000	2426
Ratee Paints	Red	30000	40000
Reliance Paint Industries	White	2500	2453
Reliance Paint Industries	Blue	4400	5800
Reliance Paint Industries	Green	21000	38000
Reliance Paint Industries	Yellow	37000	124000
Reliance Paint Industries	Red	67000	42000
Rukmani Chemical Industries	White	93	16
Rukmani Chemical Industries	Blue	2800	2789
Rukmani Chemical Industries	Green	3100	13040
Rukmani Chemical Industries	Red	5100	23650
Rukmani Chemical Industries	Yellow	95000	32000
Shalimar Paints	Red	5600	46
Shalimar Paints	Brown	14000	102
Shalimar Paints	White	16000	21
Shalimar Paints	Yellow	130000	78000
Tirupati Balaji	White	42	2308
Yeti Paints	Black	32	5931
Yeti Paints	White	4400	4062
Yeti Paints	Red	5000	3657
Paint samples with lead concentration < 90 ppm 2013 Study of CEPHED and LEADERS)			
Kansai Nerolac Paints Ltd	Bus Green	60	
Mahalaxmi Pulverising Udyog	Phiroza Blue	60	
Pasutapti Paints	Sunflower	60	
Asian Paints	Yellow	70	
Berger Jenson & Nicholson PVT LTD	Blue	70	
Hato Paint Industries	Golden	70	
Kansai Nerolac Paints Ltd	Golden Yellow	70	
Kansai Nerolac Paints Ltd	Red	70	
Kansai Nerolac Paints Ltd	Blue	70	
Berger Jenson & Nicolson (Nepal)	White	11	
Kansai Nepal (Nerolac)	White	12	
Berger Jenson and Nicholson (Nepal)	Yellow	13	
Asian Paints	Oxford Blue	18	
Asian Paints	Blaze White	25	
ICI Dulux	White	30	
Kansai Paints Nerolac	Bri. White	38	
Kansai Nepal (Nerolac)	Brown	39	
Tirupati Balaji Paints and Chemicals	White	42	
Asian Paints	P O Red	53	
Asian Paints	Bus green	58	
Asian Paints	Golden Yellow	< 9	
Paint samples with lead concentration < 90 ppm (2015 Study of CEPHED)			
ICI Dulux	Red		8
Kansai Nepal	Red		12
Jenish Paints and Chemical	White		14
Kansai Nepal	Yellow		37
Gaurishankar Paints	White		73

This is success! Lead compounds are not being intentionally used and the sample meets the new standard.

This is success! Lead compounds are not being intentionally used and the sample meets the new standard.

Indicates that it is very likely that lead compounds are no longer being used in producing this paint.

Singling out Shalimar as a major brand from India that has made important improvements since 2013, still needs to stop using lead in their yellow paints.

Comply with Government Standard of 90 ppm

MOVE OF NEPALESE PAINT (INCLUDING SMALL AND MEDIUM) INDUSTRIES

Most of the multinational paint companies such as Asian Paints, Berger Jonson and Nicolson paints, Kansai Nepal Paints with about 70 percent of market share has already made shift to unleaded paints and their products with the logo are massively available in most of the Nepalese market throughout the country.

Additionally, some of the Nepalese paint industries namely Gaurishankar Paints, Tirupati Paints, Mahalaxmi Paints, Rukmini Paints and Appolo paints has found to be made an effort to shift toward unleaded paint in the year 2013 and 2014 as shown by the results. As at least one paint samples of those small and medium paint companies found to be contain lead less than 90 ppm. This shows the ray of hope about the compliance of newly enacted mandatory lead paint standard of 90 ppm of Nepal.

Lead Concentration by Colour

Yellow, Green and Red colour paints are the most likely to contain dangerously high levels of lead. Green, yellow and red colour paints most frequently contained lead levels above 90 ppm (100 percent, 94 percent and 78 percent, respectively). 75 percent (15 out of 20 white paint samples) contained lead contamination greater than 90 ppm. Besides them, every paint samples (100 percent) of black and blue colour contain lead higher than 90 ppm.

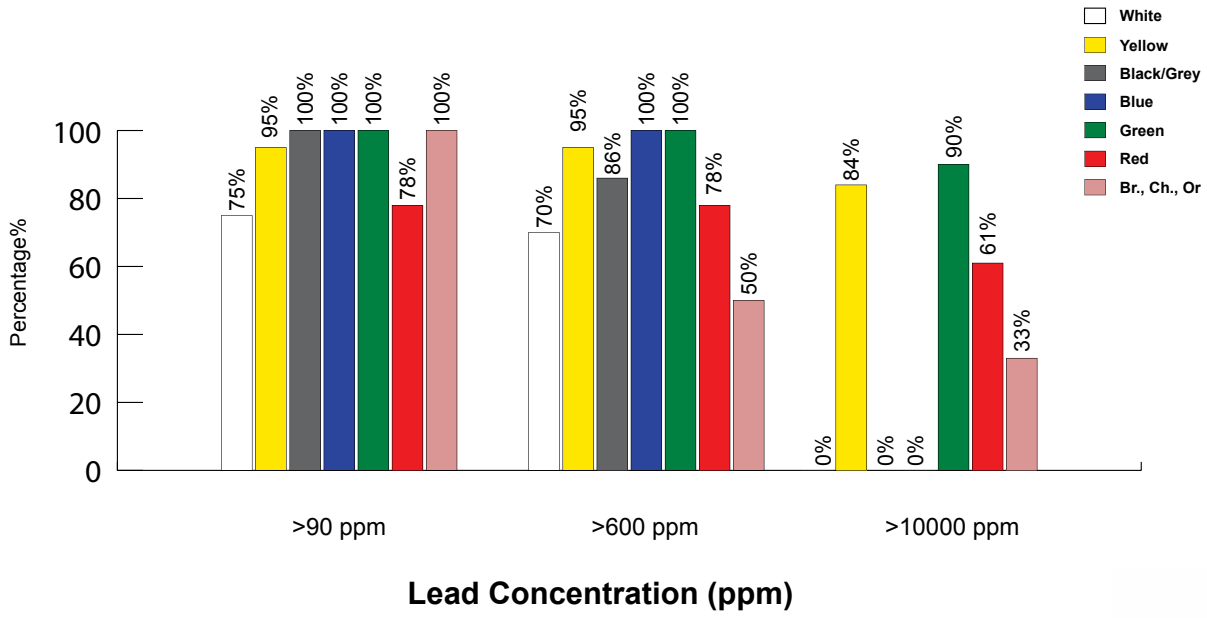


Figure 12 Distribution of Lead Concentrations in all paints alienated in 2015.
**Note: Br.:Brown/Ch.: Chocolate/Or.:Orange*

Table 4. Distribution of Lead Concentrations, Color Basis

Color	Number of Samples	Average Lead concentration (ppm)	Number of Samples ≥ 90 ppm Lead	Number of Samples ≥ 600 ppm Lead	Number of Samples ≥ 10,000 ppm Lead	Minimum lead concentration (ppm)	Maximum lead concentration (ppm)
White	20	2040	15	14	0	14	7110
Red	18	19600	14	14	11	<10	42000
Yellow	19	43000	18	18	16	37	124,000
Black and Grey	7	3710	7	6	0	96	6300
Blue	7	2850	7	7	0	930	5800
Chocolate, Brown and Orange	6	6694	6	3	2	95	19300
Green	10	29800	10	10	9	6,400	76000
Total	**87**		**77 (89%)**	**72 (83%)**	**38 (44%)**		

Lead Concentrations in Labelled Paint Cans

No paints where the label indicated "no added lead" contained high levels of lead. However the Nepal Standard (NS) mark was no guarantee for low lead levels in the paint.

45 out of 87 samples are of either Nepal Standard Marked or contain the information regarding presence of lead in the form of "NO ADDED LEAD" or different type of certification such as ISO certified and UKAS certified. 35 out of 87 paint accounting 10 paint companies contain the NS logo, 8 paint cans from 4 paint companies contain an indication of "NO ADDED LEAD" and 12 paint cans from 5 paint companies are either ISO certified or contain UKAS certification. The Nepal Bureau of Standards & Metrology (NBSM) awards NS mark to Nepalese industries in order to motivate high quality goods produced according to relevant Nepalese standards and to enable Nepalese products to compete more efficiently in regional (or global) markets.

The lead levels in the paints indicating "NO ADDED LEAD" contradict this statement, even though it is a self certification and are not verified by any third party or government body. Since, Government of Nepal already gazette the standard of 90 ppm lead in paint, NS mark becomes the mandatory for paint manufacturing industries to limit the lead content below the 90 ppm standard. If any paint manufacturing industries are found violating the law or paint can from any paint companies with NS mark found to have lead contain higher than 90 ppm is straightforwardly punished as per NBSM's law. In other word, it can be termed that, NS mark safeguard against lead.

However, this study shows that, paint samples with NS marked in 94 percent of the NS marked paint can contain the lead contamination higher than 90/600 ppm and 51.4 percent of NS marked paint can contain lead contamination higher than 10000 ppm.

Table 5. Labeling of Paint Cans in the Study

S. No.	Company/ Brand	National/ Multinational	Shade	NS Mark	No Added Lead	Other Certified	Lead Concentration (ppm)
NPL 201	Apollo Paints	National	White	Yes	No	No	88
NPL 202	Apollo Paints	National	Red	Yes	No	No	21000
NPL 203	Apollo Paints	National	Yellow	Yes	No	No	3500
NPL 209	Baba Paints	National	Black	Yes	No	Yes	3846
NPL 210	Baba Paints	National	White	Yes	No	Yes	2075
NPL 211	Baba Paints	National	Yellow	Yes	No	Yes	48000
NPL 212	Baba Paints	National	Red	Yes	No	Yes	28010
NPL 225	Jasmine Paints	National	Red	Yes	No	No	37000
NPL 226	Jasmine Paints	National	Yellow	Yes	No	No	69000
NPL 227	Jasmine Paints	National	Black	Yes	No	No	3306
NPL 228	Jasmine Paints	National	White	Yes	No	No	4500
NPL 229	Jasmine Paints	National	Green	Yes	No	No	13780
NPL 244	Nepal Paints	National	Yellow	Yes	No	No	15600
NPL 245	Nepal Paints	National	White	Yes	No	No	2937
NPL 246	Nepal Shalimar Paints	National	White	Yes	No	Yes	2632
NPL 247	Nepal Shalimar Paints	National	Yellow	Yes	No	No	21000
NPL 249	Pashupati Paints	National	Blue	Yes	No	No	3650
NPL 250	Pashupati Paints	National	Yellow	Yes	No	No	64000
NPL 251	Pashupati Paints	National	Green	Yes	No	No	35000
NPL 252	Pashupati Paints	National	White	Yes	No	No	2600
NPL 253	Pashupati Paints	National	Brown	Yes	No	No	7586
NPL 255	Pashupati Paints	National	Red	Yes	No	Yes	12800
NPL 256	Rakesh and Company	Indian	White	No	No	Yes	7110
NPL 257	Rakesh and Company	Indian	Red	No	No	Yes	31000
NPL 263	Reliance Paint Industries	National	Yellow	Yes	No	No	124000
NPL 264	Reliance Paint Industries	National	White	Yes	No	No	2453
NPL 265	Reliance Paint Industries	National	Blue	Yes	No	No	5800
NPL 266	Reliance Paint Industries	National	Red	Yes	No	No	42000
NPL 267	Reliance Paint Industries	National	Green	Yes	No	No	38000
NPL 268	Rukmani Chemical Industries	National	Red	Yes	No	No	23650

NPL 270	Rukmani Chemical Industries	National	Yellow	Yes	No	No	32000
NPL 271	Rukmani Chemical Industries	National	Blue	Yes	No	No	2789
NPL 272	Rukmani Chemical Industries	National	Green	Yes	No	No	13040
NPL 273	Shalimar Paints	Indian	Brown	No	Yes	No	102
NPL 274	Shalimar Paints	Indian	Red	No	Yes	No	46
NPL 275	Shalimar Paints	Indian	White	No	Yes	No	21
NPL 280	Yeti Paints	National	Red	Yes	No	Yes	3657
NPL 281	Yeti Paints	National	Black	Yes	No	Yes	5931
NPL 282	Yeti Paints	National	White	Yes	No	Yes	4062
NPL 283	Yeti Paints	National	Yellow	Yes	No	Yes	34000
NPL 284	ICI Dulux	Indian	Red	No	Yes	No	8
NPL 285	Berger Jenson and Nicholson	National	Red	Yes	Yes	No	43
NPL 286	Kansai Nepal	National	Red	No	Yes	No	12
NPL 287	Kansai Nepal	National	Orange	No	Yes	No	95
NPL 288	Kansai Nepal	National	Yellow	No	Yes	No	37

Figure 13 School rally for demanding Lead Paint Standard during Global Lead Poisoning Prevention week, October 2014

DISCUSSION & CONCLUSIONS

Yellow, green and red had the highest average concentrations of lead (43000 ppm, 29800 ppm, and 19600 ppm respectively).

This is the fourth study of CEPHED on lead in paints and second under the Asian Lead Paint Elimination Project to determine the lead concentration in enamel based paints. Since CEPHED began studying the lead content of paints sold in Nepal , paint brands with the largest market share such as Asian Paints (approximately 45%), Berger Paints (25%) and Kansai Nepal (approximately14%) have shifted to lead free paints as demonstrated by previous CEPHED studies. This demonstrates that paint with low lead content can be produced cost-effectively in Nepal and that companies are willing and able to make the shift.

Additionally, continuous advocacy by CEPHED and technical support to Government of Nepal, has resulted in the Ministry of Science, Technology and Environment (MOSTE) gazetting a mandatory 90 ppm lead paint standard. Similarly, the Department of Education has published a public notice via leading newspaper of the country regarding the use of lead free paints or paint complying the national standard in all the private and public school buildings and furniture's throughout the country. 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.

CEPHED has also helped raise awareness of the hazard of lead paint among consumers. Nevertheless, it remains virtually impossible for consumers to identify which paints contain unacceptable levels of lead, since most companies don't provide information on their labels and those that do can't be independently verified.

Despite all of these actions, lead levels in Nepalese paints remains unacceptably high. There still are at least 0+ small and medium sized paint companies which are producing the paint with lead concentration higher than permissible standard limit of 90 ppm. These local paint companies account for 20-30% of the total paint market in Nepalese market. These producers often face special barriers in shifting to low lead products and may require additional technical information, better access to suppliers of non-leaded paint ingredients and other types of help in re-formulating their products.

RECOMMENDATIONS

A. Government and Government Agencies

a. Ministry of Science, Technology and Environment (MOSTE) & Department of Environment (DOE).

- Inform each and every concerned government agencies, paint companies, importers, dealers, retailers and general public about newly enacted mandatory standard of 90 ppm of lead in paint and labeling provision.
- Establish strong and efficient monitoring mechanism to ensure the compliance of 90 ppm standard by paint manufacturer.
- Monitor the proper labeling of paints including lead content, list of other compounds, date of manufacture and date of expiry and labeling to alert users to the hazards of lead-contaminated dust and other materials when previously painted surfaces are scraped or sanded in preparation for repainting.
- Take decisions towards Green Public Procurement Policy (GPPP) i.e., only purchase non-leaded paints, and effectively implement it. Starting from public sectors and then to all.
- Formulate the policy regarding provision of incentives for small scale paint manufacturing industries during their shift towards lead to non-lead production.
- Initiate a third party certification process to ensure that statements of lead-free paints are valid.
- Regulate pricing and billing malpractices at industry, dealers and retailers level.

b. Ministry of Supply and Commerce and Department of Commerce and Supply Management

- Inform each and every concerned government agencies, paint companies, importers, dealers, retailers and general public about newly enacted mandatory standard of 90 ppm of lead in paint and labeling provision.
- Ensure the import of paints comply with the government of Nepal Standard of 90 ppm of lead content.
- Regularly market monitoring for compliance of lead paint standard and labeling.
- Help paint manufacturers of getting their paint tested and have proper labeling on the paint cans.
- Updated record keeping of import and export of paints and other hazardous chemicals and items in the country.
- Regulate pricing and billing malpractices at industry, dealers and retailers level.

c. Ministry of Education and Department of Education

- Make a mandatory circular or notification to all the schools, colleges both in public and private sectors to only use non-leaded paints and/or paint under the government standard of 90 ppm lead in paint.
- Immediately ban the use of leaded paints for all school infrastructures, e.g. Buildings, furniture, playing gardens and toys.
- Ask and look for Material Safety Data Sheets (Chemical Data Sheet) and labels indicating lead content and information about lead and other heavy metals when purchasing paints and toys.
- Establish programs at the district level in order to raise awareness among school children throughout the country.
- Ensure the inclusion of lead toxicity appropriately and timely manners in school / college level curricula through its concerned departments and curriculum boards.
- Declare schools, playgrounds, day-care centers and health care facilities as lead free zones.
- Immediately take the decisions of Green Public Procurement Policy (GPPP), i.e., only purchase non-leaded paints, and effectively implement it.
- Regular monitoring of all academic institutions and facilities for overall chemical safety related issues.

d. Ministry of Finance and Department of Custom

- Inform each and every concerned government agencies, paint companies, importers, dealers, retailers and general public about newly enacted mandatory standard of 90 ppm of lead in paint and labeling provision.
- Circulate the government decision among all the custom points.
- Monitor the lead contamination in imported paint and exported paints.
- Strong legal actions against the non compliance of local supplier and/or import companies.
- Updated record keeping of import and export of paints and other hazardous chemicals and items in the country.
- Full and effective implementation of GHS system in import and exports.
- Regulate pricing and billing malpractices at industry, dealers and retailers level.

e. Ministry of Industry and Nepal Bureau of Standard and Metrology (NBSM).

- Incorporation of Lead paint mandatory standard of 90 ppm in NS standard criteria as soon as possible and regulate all paint industries as per the mandatory standard.
- Permit the use of "NS Mark " only for the paints in compliance with government standard of 90 ppm.
- Inform each and every concerned government agencies, paint companies, importers, dealers, retailers and general public about newly enacted mandatory standard of 90 ppm of lead in paint and labeling provision.
- Compliance monitoring of 90 ppm standard of lead in paint and regulate the sectors.
- Provide technical assistance to small and medium-sized paint manufacturers in order to provide laboratory set up for product analyses.
- Made access and affordable laboratory testing facilities for lead paint testing for the SMEs Paint Manufacturers.
- Develop and execute the third party certification system of lead in paints

B. Paint Industry, Nepal Paint Manufacturers Associations and Chamber of Commerce Organizations

- Effectively comply the 90 ppm standard of lead in paint during paint manufacturing stage by discontinuing the use of leaded driers, leaded pigments, leaded fillers and other purposes in paint formulations and shift with non-lead substitutes.
- Have a strong cooperation mechanism between manufacturing industries regarding technical support to remove lead from their paint production and supply chain.
- Commit to a third-party certification and labeling program to ensure that all paints sold in the market meet the regulatory standard of 90 ppm and to help customer distinguish between paints that are safe and those that are not.
- Provide training on ways to minimize exposure when re-painting and other work involving surfaces previously painted with leaded paints.
- Provide information to paint dealers and retailers on lead hazards that can be distributed to customers.
- Ensure the periodical health check up and full personal protective equipments to all workers at paint production and handling units.
- Regulate and check pricing and billing malpractices at industry, dealers and retailers level.

C. Paints Dealers, Retailers and their Associations

- Only import, sale and distribute paints complying with the government mandatory standard of 90 ppm lead in paints.
- Ensure all the pains can bears the proper labeling of lead content, lead related precautionary information, date of manufactures and pricing as per the gazette notification.
- Issue the original VAT bills only for each products sold.
- Educate consumers, painters and general public about the lead and its impacts.

D. Consumers

- Check labeling on paint products when purchasing paint to ensure that they are low lead paints.
- Inform the concerned government agencies about the availability of paint without logo and information about lead and other chemicals in the market shelf.
- Keep all the receipt of paint purchased in order to realize the compensation if something goes wrong from the use of such paints.
- Get their children tested for blood lead level and practice hygienic practices at home and schools.

E. Awareness Raising

- Government must inform each and every concerned other government agencies, paint companies, importers, dealers, retailers and general public about newly enacted mandatory standard of 90 ppm of lead in paint and labeling provision.
- Government must disseminate information about childhood lead poisoning in communities to make everyone aware about lead poisoning, lead content in paints, and its consequences for human health as well as the environment.
- All the government bodies, organizations, stakeholders and parents must cooperate and join hand to raise the awareness among public about childhood health and occupational health risks linked with lead paints and lead dust.
- Government agencies as well as non-governmental organizations must conduct research on lead in paints and disseminate the results on regular basis.
- Lead poisoning related issues must be included in school or college level course syllabus in order to educate students from early level.
- Media personals and modeling agencies must educate their staffs before producing and publishing the advertisement of paints regarding the ingredients used in product.
- Doctors and other health professionals must be aware about lead poisoning and educated about the ways to minimize exposure from surfaces previously coated with lead paints.

APPENDIX A

A1 New Solvent-based, Enamel Paints Included in the Study

Sample Number	Brand Name	Color of Paint	Paint Can Size	*Purchased Price of Paint	Date Manufactured	Batch Number	Is there information on can about lead content of paint?	Parts Per Million Lead (dry weight)
NPL 201	Apollo	White	500 mL.	235	Mar-13	3553	NS	88
NPL 202	Apollo	Red	500 mL.	240	Aug-14	4294	NS	21000
NPL 203	Apollo	Yellow	500 mL.	240	Aug-14	4290	NS	3500
NPL 204	Apollolite	Black	100 mL.		Mar-14	1141	NA	96
NPL 205	Apollolite	Yellow	50 mL.		Mar-14	1142	NA	45000
NPL 206	Apollolite	Blue	50 mL.		Feb-13	1101	NA	1383
NPL 207	Nicolson	Chocolate	1000 mL.	380	NA	NA	NA	580
NPL 208	Baba Paints	Green	50 mL.	40	Sep-12	94/2	NA	6400
NPL 209	Baba Paints	Black	500 mL.	250	Jul-12	400/12	NS, ISO certified	3846
NPL 210	Baba Paints	White	50 mL.	90	Sep-12	82/2	NS, ISO certified	2075
NPL 211	Baba Paints	Yellow	500 mL.	250	May-12	384712	NS, ISO certified	48000
NPL 212	Baba Paints	Red	500 mL.	250	Jun-12	395/12	Ns, ISO certified	28010
NPL 213	Dalmia	Red	500 mL.	260	NA	NA	NA	41000
NPL 214	Dalmia	Green	500 mL.	260	Sep-15	6025	NA	76000
NPL 215	Dalmia	Yellow	500 mL.	260	Aug-14	6802	NA	45000
NPL 216	Lalupate	Green	500 mL.	180	NA	60	NA	33000
NPL 217	Lalupate	Brown	500 mL.	190	May-14	710201	NA	19300
NPL 218	Sinelac	Red	500 mL.	155	Jul-12	690402	NA	6200
NPL 219	G7	White	500 mL.	255	NA	700902	NA	2567
NPL 220	Gauri	White	1000 mL.		Sep-14	111	NA	73
NPL 221	Gauri	Black	500 mL.	275	Jul-13	5571	NA	3300
NPL 222	Gauri	White	500 mL.	390	Mar-13	5051	NA	2400
NPL 223	Deluxe	Green	50 mL.	48	NA	NA	NA	17400
NPL 224	Deluxe	Yellow	50 mL.	40	NA	NA	NA	44000
NPL 225	Jasmine Paints	Red	100 mL.	120	Jul-14	1507	NS	37000
NPL 226	Jasmine Paints	Yellow	500 mL.	335	Aug-14	1523	NS	69000
NPL 227	Jasmine Paints	Black	100 mL.	115	Jul-14	1501	NS	3306
NPL 228	Jasmine Paints	White	200 mL.	225	Apr-13	1287	NS	4500
NPL 229	Jasmine Paints	Green	100 mL.	120	May-13	1284	NS	13780
NPL 230	Jenish Paints	White	500 mL.	470	NA	3807	NA	14
NPL 231	Jenish Paints	Yellow	500 mL.	255	Jun-14	140613	NA	41000
NPL 232	Jenish Paints	Blue	500 mL.	255	Jul-14	40703	NA	3200
NPL 233	Jenish Paints	Green	500 mL.	205	Jun-14	40625	NA	34000
NPL 234	LG	White	50 mL.	48	Jul-11	NA	NA	920
NPL 235	Colorlite	White	500 mL.	280	Sep-14	710644	NA	1339
NPL 236	Colorlite	Green	500 mL.	300	Dec-13	700913	NA	31000
NPL 237	Colorlite	Red	500 mL.	300	Jan-13	6909	NA	3300
NPL 238	Colorlite	Yellow	500 mL.	300	May-14	710214	NA	9600
NPL 239	Kristal	Yellow	100 mL.	100	NA	NA	NA	33000
NPL 240	Kristal	Red	100 mL.	100	Mar-14	NA	NA	30000
NPL 241	Kristal	White	100 mL.	100	Jun-11	NA	NA	310
NPL 242	Nepal Paints	Blue	500 mL.	200	May-10	71540505	NA	2163
NPL 243	Nepal Paints	Red	500 mL.	200	Aug-11	74430908	NA	32360
NPL 244	Nepal Paints	Yellow	500 mL.	200	Dec-12	74550912	NS	15600
NPL 245	Nepal Paints	White	500 mL.	280	Aug-13	9072	NS	2937
NPL 246	Shalimar Paints	White	100 mL.	95	Jan-12	681001	NS, ISO certified	2632

NPL 247	Goldlac	Yellow	500 mL.	278	Sept. 2012	690501	NS	21000
NPL 248	Goldlac	Blue	50 mL.	48	NA	NA	NA	930
NPL 249	Danfe	Blue	200 mL.	130	Apr-12	D019212	NS	3650
NPL 250	Danfe	Yellow	500 mL.	220	Sep-14	I07144	NS	64000
NPL 251	Danfe	Green	500 mL.	220	Feb-13	B02413	NS	35000
NPL 252	Danfe	White	500 mL.	220	Aug-13	H00513	NS	2600
NPL 253	Danfe	Brown	500 mL.	220	Aug-13	H01013	NS	7586
NPL 255	Nepolite	Red	50 mL.	50	Apr-13	D01113	NS, ISO certified	12800
NPL 256	Micolite	White	50 mL.	45	NA	NA	ISO certified	7110
NPL 257	Micolite	Red	100 mL.	45	NA	NA	ISO certified	31000
NPL 258	Mayur	Black	100 mL.	80	Oct-14	NA	NA	3194
NPL 259	Mayur	White	100 mL.	140	NA	NA	NA	2426
NPL 260	Mayur	Red	200 mL.	140	Jul-13	NA	NA	40000
NPL 261	Mayur	Yellow	200 mL.	140	Jan-12	NA	NA	51000
NPL 262	American Red Belt	Yellow	500 mL.	375	NA	NA	NA	60000
NPL 263	Reliance	Yellow	50 mL.	48	Jun-13	2497	NS	124000
NPL 264	Reliance Paints	White	100 mL.	90	Oct-13	7/532	NS	2453
NPL 265	Reliance Paints	Blue	50 mL.	40	Jul-14	3/585	NS	5800
NPL 266	Reliance Paints	Red	50 mL.	50	Mar-14	11/557	NS	42000
NPL 267	Reliance Paints	Green	50 mL.	50	Jun-13	3498	NS	38000
NPL 268	Nerolac	Red	100 mL.	90	Jun-11	2776	NS	23650
NPL 269	Nerolac	White	50 mL.	50	Mar-10	1760	NA	16
NPL 270	Superlac	Yellow	500 mL.	250	May-11	1323	NS	32000
NPL 271	Superlac	Blue	500 mL.	250	May-11	1328	NS	2789
NPL 272	Superlac	Green	500 mL.	250	May-11	1323	NS	13040
NPL 273	Shalimar	Brown	500 mL.	300	Sep-12	3120004763	No added lead	102
NPL 274	Shalimar	Red	500 mL.	325	Mar-13	3130001647	No added lead	46
NPL 275	Shalimar	White	500 mL.	325	Feb-14	3140000981	No added lead	21
NPL 276	Shalimar	Yellow	200 mL.	150	NA	PM21706	NA	78000
NPL 277	Ruby Deluxe	White	100 mL.	100	NA	NA	NA	2308
NPL 278	Pearl	Brown	500 mL.	200	NA	NA	NA	12500
NPL 279	Galaxy	Grey	500 mL.	200	NA	NA	NA	6300
NPL 280	Yeti Paints	Red	500 mL.	275	Aug-14	31431	NS, ISO certified, UKAS Quality management	3657
NPL 281	Yeti Paints	Black	500 mL.	275	Feb-14	30277	NS, ISO certified, UKAS Quality management	5931
NPL 282	Yeti Paints	White	500 mL.	275	Apr-14	30849	NS, ISO certified, UKAS Quality management	4062
NPL 283	Yeti Paints	Yellow	500 mL.	250	Apr-14	31294	NS, ISO certified	34000
NPL 284	Dulux	Red	500 mL.	300	Jan-13	280437	NO ADDED Lead, No Added Mercury, No Added Cadmium	<10
NPL 285	Brolac	Red	500 mL.	310	Jun-14	B1694	NS Marked, No Added Lead, Mercury and Cadmium	43
NPL 286	Nerolac	Red	500 mL.	335	Jan-14	701201	No Added Lead, Mercury, Arsenic, Cadmium and Antimony	12
NPL 287	Nerolac	Orange	500 mL.	335	Dec-13	700701	No Added Lead, Mercury, Arsenic, Cadmium and Antimony	95

NPL 288	Nerolac	Yellow	500 mL.	335	Apr-14	710101	No Added Lead, Mercury, Arsenic, Cadmium and Antimony	37

Note: NA refers to Not Mentioned in Paint Can

*Purchased price is normally lower than the printed price on the can

NA: Not mentioned in Paint Can

NS: Nepal Standard

ISO: International Organisation for Standardization

A2 Change in Lead Content from 2013

Paint Manufacturing Company	Number of Samples	Number of Samples above 90 ppm		Number of Samples above 600 ppm		Number of Samples above 10000 ppm		Minimum lead conc (ppm)		Maximum Lead conc. (ppm)	
		2013	2015	2013	2015	2013	2015	2013	2015	2013	2015
Apollo Paints	4	4	3	4	3	2	2	1200	88	64000	21000
Baba Paints	5	5	5	5	5	2	2	6100	2075	87000	41000
Berger Jenson & Nicholson PVT LTD	1	1	0	1	0	1	0	11000	43	11000	43
Dalmia Paint & Chemical Industries	2	2	2	2	2	2	2	32000	41000	53000	76000
G 7 Industries Pvt. LTD	4	4	4	4	4	3	2	2400	2567	37000	33000
Gupta Paint Industries	2	2	2	2	2	2	2	62000	17400	68000	44000
Jasmine Paints (P) Ltd	3	3	3	2	3	1	2	190	3306	42000	37000
Mahalaxmi Pulverising Udyog	4	3	4	3	4	3	1	19	1339	62000	31000
Nepal Paints	4	4	4	3	4	1	2	420	2163	66000	32360
Nepal Shalimar paints	2	2	2	2	2	1	1	2900	2632	33000	21000
Pashupati Paints Nepolite	5	5	5	4	5	2	3	169	2600	130000	64000
Rakesh and Company	1	1	1	1	1	0	0	3200	7110	3200	7110
Ratee Paints Udhyog Pvt. Ltd.	3	3	3	3	3	1	1	1540	2426	30000	40000
Rukmani Chemical Ind. P. LTD	5	5	4	4	4	1	3	93	16	95000	32000
Reliance Paints	5	5	5	5	5	3	3	2500	2453	67000	124000
Shalimar Paints	4	4	2	4	1	3	1	5600	21	130000	78000
Tirupati Balaji Paints and Chemicals	1	0	1	0	1	0	0	42	2308	42	2308
Yeti Paints	3	2	3	2	3	0	0	32	3657	5000	5931

A3 Consumer Information about Lead on Paint Cans

Brand	Paint Company	Number of Samples	Lead content or other lead information on the label (yes/no)	Independent, third party certification of "lead safe" claims?	Information about lead hazard to children	Information about lead hazard when painting or remodeling	Specific language about lead on label
Apollo	Apollo Paints	3	No	No	No	No	No
Apollolite	Apollo Paints	3	No	No	No	No	No
Nicolson	Ashoka Paints and Chemical Industries	1	No	No	No	N o	No
Baba Paints	Baba Paints	5	No	No	No	No	No
Dalmia	Dalmia Paints and Chemical Industries	3	No	No	No	No	No
Lalupate	G7	2	No	No	No	No	No
Sinelac	G7	1	No	No	No	No	No
G7	G7 Industries	1	No	No	No	No	No
Gauri	Gaurishankar Paints Industries	3	No	No	No	No	No
Deluxe	Gupta Paint	2	No	No	No	No	No
Jasmine Paints	Jasmine Paints	5	No	No	No	No	No
Jenish Paints	Jenish Paints and Chemicals	4	No	No	No	No	No
LG	LG Paint Industries	1	No	No	No	No	No
Colorlite	Mahalaxmi Pulverising Udhyog	4	No	No	No	No	No
Kristal	Nandani Paints	3	No	No	No	No	No
Nepal Paints	Nepal Paints	4	No	No	No	No	No
Shalimar Paints	Nepal Shalimar Paints	2	No	No	No	No	No
Goldlac	Parkash Paint Industries	1	No	No	No	No	No
Danfe	Pashupati Paints	5	No	No	No	No	No

Nepolite	Pashupati Paints	1	No	No	No	No	No
Micolite	Rakesh and Company	2	No	No	No	No	No
Mayur	Ratee Paints	4	No	No	No	No	No
American Red Belt	Red Belt Paint	1	No	No	No	No	No
Reliance	Reliance Paint Industries	5	No	No	No	No	No
Nerolac	Rukmani Chemical Industries	2	No	No	No	No	No
Superlac	Rukmani Chemical Industries	3	No	No	No	No	No
Shalimar	Shalimar Paints	4	Yes	No	No	No	Yes
Ruby Deluxe	Tirupati Balaji	1	No	No	No	No	No
Pearl	Tirupati Balaji	1	No	No	No	No	No
Galaxy	Tirupati Balaji	1	No	No	No	No	No
Yeti Paints	Yeti Paints	4	No	No	No	No	No
Dulux	ICI Dulux	1	Yes	Yes	No	No	Yes
Brolac	Berger Jenson and Nicholson	1	Yes	Yes	No	No	Yes
Nerolac	Kansai Nepal	3	Yes	Yes	No	No	Yes
Total		**87**					

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EUROPEAN UNION

IPEN
a toxics-free future

सिसा (LEAD) तपाई र तपाईको बालबालिकाको निम्ति हानिकारक हुनसक्दछ ।

के मेरो घर र फर्निचरमा लगाएको रङ्गमा पाईने सिसा (LEAD) ले मेरो जन्मने बच्चालाई असर गर्छ?

किन मेरो बच्चा राम्रोसँग हुर्कन सकिरहेको छैन जान्न सक्छु ?

किन मेरो बच्चाले राम्रोसँग खादैन, बढ्दैन, र उसको पेट पनि दुखिरहने बारे जान्न सक्छु ?

किन मेरो बच्चाहरु पढाइ लेखाइमा कमजोर छन् जान्न सक्छु ?

सिसा (LEAD) को असरबाट हामी, हाम्रा बालबालिकालाई बचाउनको निम्ती सरकारबाट के कस्ता कार्य भैरहेको छ त ?

ओहो !!!!!!!! कतिधरै समस्याहरु

हो, बालबालिकालाई असर पार्ने सबैखाले अवस्थाहरुबाट सुरक्षित रहन र यी सबै कुराहरुको बारेमा सोध्ने एवं जानकारी पाउने तपाईहरु सबैको अधिकार हो ।

विभिन्न वस्तुहरु जस्तै विद्यालय भवन, घर, फर्निचर, खेलौनाहरु रङ्गाउन प्रयोग गरिने रङ्गहरुमा मिसाईएको सिसा (LEAD) नै यी सबै समस्याको मुख्य कारण हुन सक्दछ ।

त्यसैले सिसा (LEAD) नमिसाईएको रङ्गहरु मात्र प्रयोग गरी तपाई र तपाईको बालबालिका दुवैलाई सुरक्षित गर्न सक्नुहुन्छ र यो नै सबैभन्दा उत्तम उपाय हुन ।

CHILDREN HEALTH FIRST, ELIMINATE LEAD PAINTS

बालबालिकाको स्वास्थ्यलाई प्राथमिक्ता दिउँ र सिसायुक्त रंगरोङ्गनहरु उन्मुलन गरौ ।

सिसा (LEAD) को असरबाट बच्ने उपायहरु

बालबालिकाको शरीरमा सिसा (LEAD) भए नभएको नियमित परीक्षण गराउनुहोस् ।

यदि तपाई विद्यालय, घर, तथा फर्निचर रङ्गाउदै हुनुहन्छ भने जहिले पनि सिसा (LEAD) नमिसाईएको रङ्गहरु मात्र प्रयोग गर्नुहोस् ।

स्वस्थ बालबालिका र स्वच्छ वातावरणको लागि जहिले पनि हानिकारक परिमाणमा सिसा (LEAD) मिसाइएको रङ्ग प्रयोग नगर्नाका साथै सकभर सिसा (LEAD) नमिसाइएको रङ्गहरुमात्र प्रयोग गरौ ।

विस्तृत जानकारीको लागि सम्पर्क ठेगाना

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EUROPEAN UNION

IPEN
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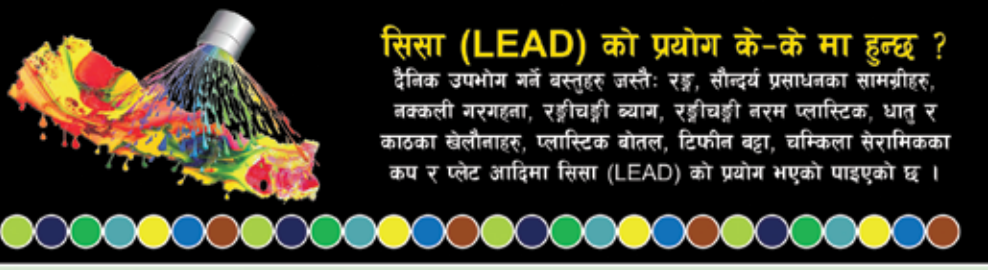
विद्यालयका भौतिक पूर्वाधारहरु (विद्यालय भवन, फर्निचर, खेलौना आदि) मा रङ्गरोगन गर्दा सिसा (LEAD) नमिसाईएको रङ्गहरुमात्र प्रयोग गरौ ।



सिसा (LEAD) को असरसम्बन्धी केही तथ्यहरु

विश्व स्वास्थ्य संगठन (World Health Organization) अनुसार सिसा (LEAD) को असरबाट हरेक वर्ष करिब नयाँ ६००,००० बालबालिकाहरु बौद्धिक विकाससम्बन्धी समस्याबाट ग्रसित हुने गर्दछ । जसमध्ये विकासोन्मुख राष्ट्रहरुमा यसको असर अत्यधिक देखिएको छ ।
(WHO/UNEP, GAELP Brochure)

सिसा (LEAD) को श्रोतहरु

सिसा भएको रङ्गले रङ्गाइएको विद्यालय भवन तथा फर्निचरमा
हुने सिसायुक्त धुलो तथा रङ्गका पाप्राहरु ।
सिसायुक्त बालबालिकाका खेलौनाहरु ।
सिसायुक्त पाइपबाट आउने खानेपानी ।
सिसा मिश्रित खानेकुरा ।

सिसा (LEAD) बाट हुने मुख्य असरहरु

सिसाबाट सबैभन्दा बढी बालबालिकाहरु प्रभावित हुने गर्दछन् ।
पढाइ लेखाइमा कमजोर हुनु, बानी व्यहोरामा परिवर्तन आउनु,
शरीरका हड्डी, शारीरिक एवं मानसिक विकास राम्ररी नहुनु ।
रक्तअल्पता, अनिद्रा, अशान्ति, पेट दुख्नु, टाउको दुख्नु, भोक नलाग्ने,
तौल घट्नु, कब्जियत तथा वान्ता हुनु ।
स्नायु प्रणाली, मुत्र प्रणाली र प्रजनन् प्रणालीमा गडबडी हुनु ।
उच्च मात्रामा सिसाको सेवन वा सम्पर्कका कारण अचेत भै मृत्यु समेत हुन सक्दछ ।

सिसा (LEAD) को प्रभावबाट बच्न अभिभावक तथा शिक्षकले ध्यान दिनुपर्ने कुराहरु

बालबालिकाको हात र खेलौना पटक पटक राम्रोसँग धुनुपर्छ ।
खाना बनाउँदा जहिले पनि चिसो धाराको पानीमा पकाउनुपर्छ ।
बालबालिकाको शरीरमा सिसाको मात्रा भए नभएको बारे पाउन नियमित रुपमा रगत परिक्षण गराउनुपर्छ ।
विद्यालय भवन, फर्निचर, इयाल, ढोका, भित्तामा जमेको धुलोमा सिसाबारे नियमित रुपमा परिक्षण गराउनुपर्छ ।
विद्यालय भवन, फर्निचर, इयाल, ढोका, बेञ्च, डेस्क, भित्ता तथा अन्य पूर्वाधारहरुमा रङ्गरोगन कार्य गर्दा सिसा नमिसाईएको रङ्गहरु मात्र प्रयोग गर्नुपर्छ ।

Pb
Lead

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for a Healthy Future

विद्यालय भवन, फर्निचर तथा अन्य भौतिक पूर्वाधारहरुमा रङ्गाउने रङ्गहरुमा भएको सिसा (LEAD) को बारेमा शिक्षा विभाग तथा PABSON को ध्यानाकर्षण भएको छ र जनचेतना फैलाउन तथा सिसा (LEAD) को असरलाई न्यूनीकरण गर्नका निम्ति सबै सामुदायीक, संस्थागत विद्यालय तथा शैक्षिक संस्थाहरुले हानिकारक परिमाणमा सिसा (LEAD) मिसाइएको रङ्ग प्रयोग नगर्नाका साथै सकभर सिसा (LEAD) नमिसाइएको रङ्गहरुमात्र प्रयोग गर्न आग्रह गर्दछौं ।

विस्तृत जानकारीको लागि सम्पर्क ठेगाना

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