



Toxics Link  
for a toxics-free world

# DOUBLE STANDARD

**Investigating Lead (Pb) Content In Leading  
Enamel Paint Brands In South Asia**





# DOUBLE STANDARD

## Investigating Lead (Pb) Content In Leading Enamel Paint Brands In South Asia



**Study by:**

Toxics Link, New Delhi

Environment and Social Development Organization-ESDO, Bangladesh

Center for Public Health and Environmental Development (CEPHED), Nepal

Support: Swedish Society for Nature Conservation



Copyright © Toxics Link, 2011.  
All rights reserved.

Published in 2011 by

**Toxics Link**

H-2, Jangpura Extension

New Delhi - 110014

Phone: +91-(11)-24328006, 24320711

Fax: +91-(11)-24321747

Email: [info@toxicslink.org](mailto:info@toxicslink.org)

[www.toxicslink.org](http://www.toxicslink.org)

---

**Research Team:**

**Rajeev Betne, Senior Programme Coordinator, Toxics Link**

**Dr. Prashant Rajankar, Senior Programme Officer, Toxics Link**

**Ramcharitra Sah, Executive Director, CEPHED, Nepal**

**Dr. Shahriar Hossain, Secretary General, ESDO, Bangladesh**

**Editorial Assistance:**

**Rambha Tripathy, Coordinator, Toxics Link**

# Contents

<b>Foreword</b>	1
<b>About Toxics Link and partners</b>	3
<b>Acknowledgements</b>	5
<b>Executive Summary</b>	6
<b>1. Introduction and Study Backdrop</b>	9
1.1 Lead in paints – a perspective	9
1.2 Toxics Link's Recent Investigations on Lead in paints	10
1.3 Lead standards for paints	10
1.4 Brief Overview of Paint Business in the Indian Sub-Continent	11
1.4.1 Broad Regional Overview	11
1.4.2 Indian Paint Business	12
1.4.3 Nepal Paint Business	13
1.4.4 Bangladesh Paint Business	13
1.4.5 Concluding Paint Business in India, Nepal and Bangladesh	13
<b>2. Recent Developments and Rationale for the South Asia Paint Study</b>	15
<b>3. Scope and Objectives</b>	17
3.1 Focus of the Study	17
3.2 Objectives	17
3.3 Limitations	17
<b>4. Sampling and Analytical Methodology</b>	19
4.1 Materials and Methods	19
4.1.1 Sampling	19
4.1.2 Sample preparation	19
4.2 Laboratory methods	21
4.3 Digestion procedures	22

<b>5. Results and Discussion</b>	23
5.1 Broad Overview of Results	23
5.2 Colours and Brands	25
5.3 Country Perspective	26
5.4 Regional Perspective – Evidences of manufacturer’s Double Standard	28
5.5 Key Findings from the lab tests	28
<b>6. Conclusions</b>	30
<b>7. Recommendations</b>	31
7.1 Regulation	31
7.2 Corporate Responsibility and Government Action	31
7.3 Concerted Global Action and Stakeholders Involvement	32
<b>8. End Notes</b>	33
<b>9. Bibliography</b>	34

# List of Tables and Figures

## Tables

Table 1: Regulation for Lead in Paint	11
Table 2: Paint Manufacturers Market Share (Organized Sector Only) in India, 2009-10	12
Table 3: Details of Enamel Paint Samples Purchased from Nepal, India and Bangladesh Markets	20
Table 4: Lead Concentration in Tested Sample	23
Table 5: Colour Culprits	25
Table 6: Brand Matters	26
Table 7: Country Perspective	26

## Figures

Figure 1: Annual Growth of Paint Industry In India, 1996-2009 (Paintindia, Snapshot of Indian Coatings Industry, 2009)	12
Sticker 1: Asian Paints, India Claim For Lead Free Product	13
Figures 2-7: Lead Concentration (In ppm) Across Brands – Evidence Of Double Standard	27

## Boxes

Box 1: Lead Toxicity (WHO/UNECE, 2006)	9
Box 2: Why Lead is Used in Paints	10





# Foreword

## **Lead in paints – not here, not anywhere!**

It is a shame to see paints with lead loaded in them in this day and age. This is not by accident. This is by design. The paint industry adds lead to its formulations for various reasons which it provides, such as brighter colors, longevity, better protection etc., and makes these attributes as part of their high profile advertisement campaigns. They lure customers, attempt to increase market share and enroll high profile films stars to do so. What they do not say is that their paints have lead in them, which will alongside damage the IQ of children, and cause irreparable other health damage, contaminate our landfills and groundwater and pollute our air.

Why do they still do it -when irrefutable evidence against lead in paints has been around for over a century? When they cannot sell such products in western markets of the USA and Europe? When they have the technology to substitute lead in paints easily? When there is barely any cost to them to do so? With this full knowledge, technical capability of change and no real cost, can this act be termed less than 'criminal?'

As the campaign in India for removing lead from paints grows stronger, it appears that things are not changing in our neighboring countries. Our fellow civil society partners in Sri Lanka, Bangladesh and Nepal have found that out. We worked with them to unravel the secrets of the paint industry, some of which is infact based in India. Does the Paint industry sell those products in the neighboring countries, which it cannot sell in India anymore? It does seem like it, as this study shows.

It also shows the role of public opinion and public campaigning. It seems without public awareness and public protest, the paint industry will add lead to paints till the last drop. It will push these products to new corners of the world where there is less known about them.

It is time for proactive action by the Industry. It is time to take responsibility.

Lead in paints – not here, not anywhere!

Ravi Agarwal  
Director  
Toxics Link





# About Toxics Link and Partners

Toxics Link's Mission Statement - *"Working together for environmental justice and freedom from toxics. We have taken upon ourselves to collect and share both information about the sources and the dangers of poisons in our environment and bodies, and information about clean and sustainable alternatives for India and the rest of the world"*

Toxics Link is an environmental research and advocacy organization set up in 1996 by The Just Environment Charitable Trust. It lays a special emphasis on reaching out to numerous grassroots groups; community based organizations and the public at large through its empirical study-based information on environmental issues. Toxics Link works closely with all other stakeholders working on similar issues and has played a seminal role in facilitating the development of several common platforms for them on the national, regional as well as international levels. Toxics Link works in the area of Community and Waste, Toxics-free Health Care, Clean Industry, Chemicals and Health and Information and Communication. We work from New Delhi and have our nodal offices in Chennai in Tamil Nadu and Kolkata in West Bengal.

In 2009, Toxics Link undertook a new initiative in the South Asia region for enhancing civil society participation in Chemicals Management funded and supported by the Swedish Society for Nature Conservation (SSNC). Presently the research and campaign work is being carried out in Sri Lanka, Bhutan, Nepal and Bangladesh in partnership with ten Civil Society Organisations located in these countries. The campaign against lead in household paints has been one of our flagship programmes in the region.

**Center for Public Health and Environment Development (CEPHED)** is a non-governmental, non-secretariat and non-profit making organization based in Kathmandu, Nepal. CEPHED was founded in October 2004 by and through the contribution and coordination of a consortium of Environmental Scientists, Pharmacists, MBAs, Chemical Engineers, Sociologists, Economists and a group of public-spirited activists. Its aim is to improve environment management practices and public health. CEPHED collaborates with several national, regional and international agencies. It has been spearheading the 'lead in paint' campaign in Nepal since 2010.

Sri Ram Charitra Sah, a well-known environmentalist, currently heads CEPHED.



**Environment and Social Development Organization (ESDO)** is an independent and non-profit organization dedicated to the conservation of bio-diversity, working towards achieving environmental and social justice. ESDO is based in Dhaka, Bangladesh and spreads environmental awareness amongst the people of various regions in Bangladesh, and assists communities to achieve self-reliant and eco-friendly lifestyles through capacity building initiatives. It collaborates with several national, regional and international agencies. ESDO is the main facilitator in leading the 'lead in paint' campaign in Bangladesh begun in 2010.

Dr. Shahriar Hossain, ecologist and journalist, heads ESDO.

### **CONTACT ADDRESS**

#### **Toxics Link**

H-2 Jangpura Ext., New Delhi – 110014, India

**P** +91 11 24328006/ 23420711

**F** +91 11 24321747

**E** info@toxicslink.org

**W** www.toxicslink.org

---

#### **Center for Public Health and Environmental Development (CEPHED)**

Naya Basti, Imadol -5, Lalitpur

Kathmandu, Nepal

**P** 977-1 5201786

**M** 977- 9803047621

**E** cephed04@yahoo.com

---

#### **Environment and Social Development Organization (ESDO)**

House # 8/1, Block-C, Lalmatia, Dhaka-1207,  
Bangladesh

**P** +880-2-912-2729,

**M** 880- 1711545066

**F** +880-2-9130017

**E** shahriar25@gmail.com info@esdo.org

**W** www.esdo.org



# Acknowledgements

We take this opportunity to thank all those who were instrumental in shaping-up of this report.

We acknowledge the staff members of Toxics Link, India, CEPHED, Nepal and ESDO, Bangladesh who assisted us in numerous ways while working on this report.

Our distinctive appreciation to the staff of Delhi Test House, Delhi, India for testing paint samples from Nepal, Bangladesh and India that helped us in bringing forward some critical findings about common paint brands in South Asia.

We also express our gratitude to Ms. Lolita Shukla for editing the report.



# Executive Summary

Lead (Pb) compounds have been historically used by paint manufacturers. A number of properties of lead make it commercially attractive for its use in paints. It has colour vibrance and the ability to hold pigments well. It helps paints stand up well to outside weather elements, impart high degree of corrosion resistance and also reduces drying time. In the form of lead carbonate and lead oxides, it has excellent adhesion, drying, and covering abilities. Economically, it is relatively inexpensive.

However, lead based decorative paints (and other products such as gasoline for that matter) have posed several health problems in the developed world. Lead based paints have long been proven to be associated with elevated blood lead levels in children causing subsequent lead poisoning. Scientific evidences have established that children are the most vulnerable population and can be seriously impacted even at very low levels of blood lead. While the toxicity of lead becoming apparent, several western countries have enacted ban or imposed restriction on the use of lead in interior paints (Markowitz, 2000). Countries like the US and China have restricted its use to 90 ppm in decorative paints. Also, the sixth session of the Intergovernmental Forum on Chemical Safety (IFCS), held from 15-19 September 2008 in Dakar, Senegal, adopted a unanimous resolution to eliminate lead from paints worldwide.

Whereas *The Blacksmith Institute's World's Worst Pollution Problems Report 2010* indicts lead (Pb) as the deadliest of top six toxic threats globally (and estimates that 18-22 million people

worldwide are impacted currently) and the World Health Organisation (WHO) reviewing the current science on lead toxicity, it is now widely accepted that there is 'no safe blood lead level' in humans. Sans WHO's efforts, there has been a concerted global drive against the use of lead in products that eventually become sources of lead exposure and poisoning.

Toxics Link has been actively campaigning in the South Asia region on the issue of chemicals safety through a chain of regional partners. Our interest in South Asia lies primarily in the fact that we share some common concerns and the proximity of our borders makes us vulnerable to a spillover of toxic effects.

Asia is an ever-growing market for paints. Various studies suggest that Asia will eventually emerge as the largest consumer of paints, keeping in mind the growth rate over the years. The coating solution sector has been growing at an average rate of about 10% in recent years. Overall, decorative paint accounts for 60-70% total paint market in the region. The players in the organized sector dominate the paint business and their market share is between 60-90% in different countries belonging to the region. Multinational brands such as Asian Paints, Berger, Nerolac, Jenson and Nicholson and ICI are the major players and happen to have overlapping interests in the paint market in the region.

The major worry in the region is that the countries have either voluntary standards or no standards for lead in decorative paints. While India has a voluntary ECO-Mark standard for lead (1000ppm)



in Sri Lanka it is 600ppm. There is no regulatory mechanism to restrict the lead concentration in paints in Nepal and Bangladesh. To summarize the existing regulatory framework in the region is such that manufacturers are not mandated to limit lead in their products. While claims have been made by paint majors regarding production and sale of lead-free decorative paints in the region, many independent studies suggest that several of them continue to have lead in excessive quantities. Further, in our recent engagements on the issue we found that the paint manufacturers tend to take advantage of the non-existent lead in paint standards in countries like Nepal and Bangladesh where the lead concentration in leading paint brands were found to be alarmingly high.

Looking at the closely knit, overlapping and integrated paint business, growing public health concerns over the use of lead in paint in the region and the existing non-enforceable regulatory mechanism, we decided to take up this study of common paint brands to affirm if the acclaimed and responsible multinationals adhere to comparable standards across countries of South Asia region. In short, we wanted to ascertain whether the leading paint manufacturers follow 'double standard' in the region. The objectives of the study are as follows:

## Objectives

- a. To detect the total lead content present in common enamel paint brands (Asian Paints, Berger, Nerolac and ICI Dulux) available in the South Asia region;
  - b. To test the hypothesis whether household decorative paints available in the region have varied levels of lead content across identical brands;
  - c. To lay stress on the need for a stricter, mandatory and comparable standard for lead in household paints in the region;
  - d. To flag-off an effective dialogue on 'Globally Harmonized Standards System (GHS)'
- e. To feed into the larger global goal of having lead-free household decorative paints;

A total of 27 paint samples were purchased (9 from Delhi, India; 12 from Kathmandu, Nepal and 6 from Dhaka, Bangladesh) having manufacturing dates between February 2009 and August 2010. The samples were purchased between October 2010 and December 2010.

The samples were analyzed for their lead content at Delhi Test House (NABL accredited lab – ISO/IEC 17025:2005), A- 62/3, G.T. Karnal Road, Industrial Area, Opposite Hans Cinema, Azadpur, Delhi- 110033 using Hotplate or Microwave-based Acid Digestions and Inductively Coupled Plasma Emission Spectroscopy, EPA, PB92-114172, Sept. 1991; SW846-740 (US EPA, 2001).

## Key Findings

- a. Seventeen samples (63% of total 27) found to be exceeding US standard limit of 90ppm. They cumulatively exceed the US standard by 422 times;
- b. Twelve samples (44% of total 27) collectively exceed the limit of 1000ppm (IS standard) by over 53 times;
- c. The top three samples having highest lead concentrations are –
  - i. Berger, Golden Yellow - Nepal - 2,12,700ppm;
  - ii. Berger Robbialac, Golden Yellow – Bangladesh - 1,21,900ppm;
  - iii. Asian Paint, DP Orange – Nepal - 64,400ppm;
- d. Overall, all shades of yellow and orange have been found to contain the maximum lead concentration with a cumulative average of 48,500ppm across brands;
- e. Brand-wise, Berger samples exhibited maximum lead concentration with cumulative average of 51,723.2ppm for various shades across countries. This is followed by Asian



Paints with 16,124.7ppm (cumulative mean). ICI Dulux came out to be the cleanest with 65.33ppm mean lead concentration, much below the US's 90ppm limit;

- f. The lowest lead concentration however was found in Asian Paints, P O Red shade from India with 7.15ppm;
- g. Country-wise, paint samples from Bangladesh exhibited highest lead concentration (cumulative average 42,286.6ppm), followed by Nepal with cumulative average lead concentration of 28,417.6ppm. Indian enamel paint samples have the least average concentration across brand (cumulative average 5,810ppm). However, Berger's Indian samples showed high cumulative average of 25,950ppm across various shades.
- h. The regional comparisons across brands and shades confirm clear differential standards. However the variations in lead concentration across identical shades from Berger and Asian Paints are more pronounced.

## Conclusions

- a. The household paint business in the region is growing at over 10% annually;
- b. Asian Paints, Berger, ICI and Nerolac are the clear market leaders in the region with 60-90% market share;
- c. The regulation of lead in paints in the region is quite lax with countries like Nepal and Bangladesh having no legal mechanism to address this issue;
- d. The majority of paint manufacturers continue to add lead in paints across the states of the region;
- e. Market leaders such as Asian Paints and Berger seem to follow clear differential standards across the South Asia region;The following confirm our hypothesis of double standard followed by paint companies-
  - i. Asian Paints and Berger claim to have gone lead free in the region. However,

Berger, being a group associate of Asian Paints still adds a huge amount of lead in paints meant for Indian consumers while Asian Paints have gone lead-free;

- ii. Different shades of Asian Paints from Bangladesh exhibit high levels of lead;
- iii. There is also high but differential lead levels in Berger and Asian Paints samples from Bangladesh;
- iv. Nerolac samples from Nepal (exported from India) have higher lead content compared to Nerolac samples from India.

## Key Recommendations

- a. The paint manufacturers must immediately shift to a lead-free regime across the region. They must stop pushing their products to new corners of the world where the issue is less known. Double Standard by them is not acceptable.
- b. Governments must enact stricter and mandatory standards for lead in paints, which are comparable across the South Asia region. It is required to initiate steps towards Globally Harmonized Standards System. Possibly forums like South Asian Association for Regional Cooperation (SAARC) need to be worked on in such matters;
- c. The governments must (till the time the regulations are enforced) notify through a circular that educational institutions, especially schools and play houses for kids, must use only the lead free paints available in the market;
- d. The global partnership on lead in paints formed under UNEP and WHO in May 2009 at ICCM2 should be strengthened further by all national governments and the industry;
- e. Every other stakeholder such as the civil societies, educationists, healthcare professionals and the media etc., must come forward for spreading mass awareness on this issue.



# 1. Introduction and Study Backdrop



## 1.1 Lead in Paints – a perspective

Lead\* (Pb), a well-known toxic heavy metal (Box 1) has wide spectrum use due to its unique physico-chemical properties. However, in the recent decades due to its highly toxic consequences there has been a global drive to phase-out and find alternatives to this heavy metal in various processes and products (e.g., gasoline, paints, toys, electrical gadgets etc.). Since its phase-out from gasoline (that was considered the major source to lead poisoning), lead containing decorative paints are considered to be the next major source of lead exposure and poisoning; Clark, et al., 2005. Researches in the west have already established lead based decorative household paints significantly contributing to long-term irreversible health impairment, especially in children and unborn fetuses. Lin-Fu in 1967 and

Clark, et al. in 1985 concluded that lead-based paints in older houses had association with elevated blood lead levels in children residing in such houses ingesting paint chips by natural behavior or inhale the lead-ridden dust.

For over seventy years now, dangers represented by lead-based paint manufacturing and applications had led many western nations to enact bans or restrictions on the use of white lead for interior paint (Markowitz, 2000) whereas nations like the US and China have restricted its limit to 90ppm in decorative paints. Also, the

### Box 1: Lead toxicity (WHO/UNECE, 2006)

Lead is a well-known neurotoxic metal. Impairment of neurodevelopment in children is the most critical lead effect. Exposure in uterus, during breast-feeding, and in early childhood may all be responsible for this impact. Lead accumulates in skeleton and its mobilization from bones during pregnancy and lactation causes exposures to foetus and breast fed infant. Hence, life time exposure of women before pregnancy is dangerous. Epidemiological studies show consistently that effects in children are associated with lead levels in blood (Pb-B) of about 100-150 g/l. There are indications that lead is harmful even at blood lead concentrations considerably below 100 g/l and there may be no threshold for these effects.

- Lead (Pb) is categorized as heavy metal belonging to group IV A (14) of the periodic table having atomic number 82 and relative atomic mass 207.2. Pure lead is a silvery-white metal that oxidizes and turns blue-grey when exposed to air (USA EPA, 1998). It is soft (enough to be scratched by finger nail), dense (11.3 g/cm<sup>3</sup>), malleable and readily fusible. Alloying it with small amounts of arsenic, copper, antimony or other metals hardens lead. Lead-containing products are manufactured using these alloys. The use of lead, and the process of extracting lead from ore, date back to ancient times ; the earliest known example of metallic lead is a metal figure recovered from the Temple of Abydos in Upper Egypt, considered to date from 4000 BC (Thornton et al., 2001). Metallic lead occurs rarely in nature. Lead is usually obtained from sulphide ores, often in combination with other elements such as zinc, copper and silver. Its abundance in Earth's crust is about 0.0013 percent. Lead exists in three oxidation states Pb(0)-elemental form, Pb(II) and Pb(IV) and has three chemical forms, viz., metallic lead, inorganic lead compounds and organic lead compounds



## Box 2: Why Lead is used in paints

Lead (Pb) is added to paint not only to impart color but also to make it durable, corrosion resistant, and to improve drying. It provides longevity to coatings on walls, woods and metals. A number of lead compounds can be used as pigments in paints such as lead oxide, lead carbonate (also known as white lead) and lead chromates / molybdates (ILZSG, 2004). Lead carbonate was historically used for wall paint in households and still is a significant source of lead exposure. Lead chromates, molybdates and sulphate are still widely used. They are inorganic pigments for bright and opaque yellow, red and orange colours in paints. Lead chromates represent 1 percent of the total lead use worldwide (ILZSG, 2004). There are, however, readily available substitutes for all these lead compounds.

sixth session of the Intergovernmental Forum on Chemical Safety (IFCS), held between 15 and 19 September 2008 in Dakar, Senegal, adopted a unanimous resolution to eliminate lead from paints worldwide.

## 1.2 Toxics Link's Recent Investigations on Lead in Paints

India is a growing market for decorative household paints (Figure 1), which is expanding at over 10% annually since a decade. Gauging the impending threat from lead containing household paints, Toxics Link brought out two full-blown reports in the last four years investigating the quantum of lead in decorative paints sold in India and other developing countries. While in 2007, we studied major paint brands available in India, in 2009 we brought out an even more elaborate report analyzing a total of 317 decorative paint samples, fetched from eleven countries (Sri Lanka, Philippines, Thailand, Tanzania, South Africa, Nigeria, Senegal, Belarus, Mexico, Brazil

and India), for their lead content.

While the primary objective of these studies was to determine the lead concentration in household decorative paints marketed in developing nations, they were also intended to, a) showcasing the toxic load translated through these paints; b) advising that the paint manufacturers have the responsibility to check this toxic exposure; c) impacting policy regulations with regard to lead in paints; and d) creating mass awareness on the issue.

Both the abovementioned studies (A Brush with Toxics: An Investigation on Lead in Household Paints in India, 2007 and Lead In New Decorative Paints, 2009) confirmed high lead concentrations in the investigated paint samples. Of the 31 Indian enamel paint samples of well-known paint brands that were analyzed in 2007, 83.87 % had >600 ppm (US standard at that time) lead content while 61.3 % samples had >5000 ppm.

Out of the total 317 samples studied in 2009, 53 % were found to contain more than 90 ppm (revised US standard) of lead, while 50% samples had lead concentrations above 600 ppm. Significantly, 68.5 % of enamel samples had lead concentrations above 90 ppm, while 65% of enamel samples had lead concentrations above 600 ppm. The average lead concentration in enamel samples was 23,707.1 ppm.

## 1.3 Lead Standards for Paints

India has a voluntary standard of 1000ppm for lead in paints. To be more specific, the existing standard for maximum content of lead in paints in India is governed by IS 15489:2004. The ECO-Mark that governs the 1000ppm standard under the same IS reference is optional (Table1). Therefore, the existing Indian standard does not mandate the paint manufacturers to subscribe to these standards before marketing their products. This is possibly the reason why we

Table 1: Regulation for lead in Paint		
Country	Standard Limit	Regulatory Body
Western world		
USA	300ppm for children's products 90ppm for paints	US Consumers Product Safety Commission, Washington DC, January 2009
European Union	1000ppm, moving gradually to lead-phase out	European Union Restriction of Hazardous Substances Directive, February 2003
Canada	90ppm	Consumer Product Safety Bureau, Health Canada, June 2005
Australia and New Zealand	90ppm 25ppm for finger paints	Consumer Product Safety Standard, Standards Australia, January 2009
Asia		
China	600ppm Revised to 90ppm	China National Paints and Pigments Standardization Technical Committee, December 2009
India	No limit exists	Bureau of Indian Standards, IS 15489:2004
	Voluntary 1000ppm in paints	Bureau of Indian Standards, Eco-Mark (optional) under IS 15489:2004
Sri Lanka	600ppm (attempting to revise this to 90ppm)	Sri Lanka Standards Institute
Nepal	No legal provision	Nepal Standard, Department of Custom, Nepal
Bangladesh	No legal provision	Bangladesh Standards and Testing Institution

still find high lead concentration in Indian paint samples.

In the light of the above table, our studies of the past have revealed an urgent need to bring in stricter standards while there are safer alternatives (such as titanium dioxide) to lead available. However, since February 12, 2010, when the Department of Industrial Policy & Promotion, Ministry of Commerce and Industry, Government of India, called a meeting on this issue attended by paint and pigment manufacturers and their association representatives, the Bureau of Indian Standards and Civil Society representatives, the ground realities have not changed.<sup>1</sup>

The situation in other parts of Asia is approximately the same except in China (Table1).

## 1.4 Brief Overview of the Paint Business in the Indian Sub-Continent<sup>2</sup>

### 1.4.1 Broad Regional Overview

According to an article published in *paintindia*, February 2008<sup>3</sup> the global paint consumption was 36,060,000 tones in 2006 with Asia Pacific production and consumption of paints at 11,195,000 tones and 11,226,000 tones respectively. The mean per capita consumption was around 3.1kgs (Asia Pacific) while the world average was at 6.6kgs/capita<sup>4</sup> whereas the mean per-capita paint consumption in the Indian sub-continent ranges between half a kg to three kgs. Various sources also suggest that Asia would eventually emerge as the largest continent in the paint market after years of steady growth. India



already happens to be the sixth largest paint producer in the world.

### 1.4.2 Indian Paint Business

According to the Department of Industrial Policy and Promotion (DIPP), Ministry of Commerce and Industry, Government of India, the market share of the organized sector in Paints & Allied Products Industry (exempted from compulsory licensing) is roughly 57% while 43% share goes to the unorganized sector. There are 10-12 main players in the organized sector and over 2000 small and medium scale units form the unorganized sector. The market share of top five players within the organized sector is provided in Table 2. Nerolac and ICI dominates the industrial paint business

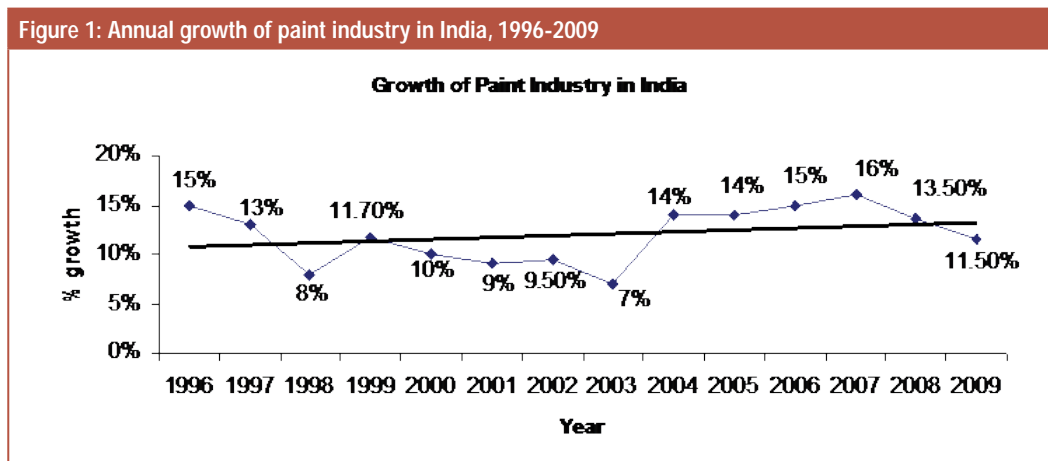
while Asian Paints and Berger respectively command 38% and 16% market share in the decorative paint business, together having a market share of 54%.

It is viewed that due to the low per capita paint consumption in India (different sources quote it from 0.5kg/capita to 1.35kg/capita) compared to the world average, there is tremendous potential for expansion in this sector. This is corroborated by the fact that since 2004 the paint industry has grown at an annual average rate<sup>5</sup> between 11% and 16%. The growth statistics suggest that in the last 15 years the paint sector has been growing at a minimum rate of 10% annually (Figure 1).

**Table 2: Paint Manufacturers Market Share (organized sector only) in India, 2009-10**

S.No	Paint manufacturers	Share in organised sector
1	Asian Paints (India) Ltd. (APIL)	55%
2	Goodlass Nerolac Paints Ltd. (GNPL)	11%
3	Berger Paints	10%
4	ICI (India) Ltd.	7%
5	Jenson & Nicholson Ltd. (J&N) & Others Players in organized Sector	6%

Source: Annual Report 2009-10, DIPP, MoC&I, GoI



Source: paintindia, snapshot of Indian Coating Industry, 2009



Sticker 1: Asian Paints, India claim for lead free product ([www.asianpaints.com](http://www.asianpaints.com))



Major paint brands such as Nerolac, ICI and Asian Paints claimed to have moved towards the lead-free regime in the last couple of years.

### 1.4.3 Nepal Paint Business

In Nepal, according to a recent survey done by the Center for Public Health and Environmental Development (CEPHED), Nepal, there is an increased demand for the branded paints in recent times and the multinationals such as Asian Paints, Berger, Nerolac, ICI etc. are making inroads into Nepal. While Asian Paints and Berger (Jenson and Nicholson) have their manufacturing units in Nepal, Nerolac and ICI brands are imported from India. There are other brands such as Red Belt and HatoGold being imported from USA and Thailand respectively.

Business Line, an Internet edition of the financial Daily from THE HINDU group of publications on June 16, 2001 reported that Berger and Asian Paints together have a market share of 50%<sup>6</sup> in Nepal. The news article also suggests through the company sources that the market is fast expanding for these brands, possibly at the rate of 5-6% annually. However, due to low price, local paints manufacturers such as Pashupati Paints, in business for about 26 years now<sup>7</sup> still hold a sizable market share.

The Asian Paint in Nepal claims their products have gone lead-free since 2008.

### 1.4.4 The Bangladesh Paint Business

The Bangladesh paint industry is worth about 10 billion Bangladeshi Taka, approx 0.14 billion USD<sup>8</sup>. More than 37 large, small and medium sized companies are engaged in paint production in Bangladesh. With rising demand and competition, most of these companies are altering their marketing strategies by introducing new products and promotional offers.

Berger, Asian, Roxy, Pailac, Aqua and Elite are the major players and command over 90 % market share. Berger Paints (was known as Jenson and Nicholson in Bangladesh before 1970) alone holds 48% market share<sup>9</sup>, followed by Asian Paints 12 percent, Roxy 10 %, Pailac and Aqua each 7 % and Elite Paints 5%. The Berger management sources however suggest they have a market share of about 55%. It is estimated that the paint industry here has posed a double-digit annual growth in recent times.

With paint demand at about 43,000 tones, per capita paint consumption in Bangladesh is roughly 250gms/capita, indicating tremendous scope for sector expansion in the coming years.

Asian Paints and Berger claim to have gone lead-free in Bangladesh.

### 1.4.5 Concluding Paint Business in India, Nepal and Bangladesh

- The coating solution sector has been growing at an average rate of about 10% in recent times and the demand is going to further rise owing to fast pace development in the region;
- The average per capita consumption of decorative paints being quite low (250 grams to about a kilogram), there is tremendous potential for scaling up in this sector;
- The paint business is dominated by the organized sector player and their market

share is between 60 and 90%;

- d. Decorative paints account for about 60-70% total paint business in the region;
- e. The major players in the organized sector are Asian Paints, Berger, Nerolac, Jenson and Nicholson and ICI;
- f. ICI and Nerolac has major stake in industrial paints while Asian Paints and Berger are the major players in the decorative paint business with over 50% of market share (and expanding by the day);
- g. Asian Paint also sells in the name of APCO / APCOLITE in this region;
- h. Berger also sells in the name of Berger Jenson & Nicholson in Nepal;
- i. Since November 2002, Berger has been a part of the Asian Paints Group;
- j. While, tall claims have been made by paint majors regarding their voluntary move to sell lead-free decorative paints, independent studies suggest that the majority of them still enjoy the loose regulatory regime.



## 2. Recent Developments and Rationale for the South Asia Paint Study



More than a decade has passed since Toxics Link began actively campaigning in the South Asia region on the issue of chemicals safety through a chain of regional partners. Our interest in the region lies primarily in the growing concerns we share and the proximity of our borders that make us vulnerable to a spillover of toxic effects. The previous section has suggested the looming threat of lead exposure in the region through household decorative paints.

In collaboration with our regional partners, in the latter half of 2010, we commissioned a study to examine the presence of lead in decorative paints marketed in Nepal and Bangladesh. A brief synopsis of the studies has been provided below.

In Nepal, Centre for Public Health and Environmental Development (CPHED) carried out a study of a total of 24 samples of different multinational and national paint brands available in Nepalese markets. The samples were analyzed at Delhi Test House, Delhi (NABL accredited lab – ISO/IEC 17025:2005) for total lead concentration. The laboratory analyses showed the presence of lead in all samples in varying degrees of concentration. The range of lead concentration varied between 3.98ppm to 73966.4ppm. The average lead concentration in all 24 samples

was found to be 6574.71ppm, which is about 73 times higher than the US standard (90 ppm). The average lead concentration in enamel samples was 12,114ppm. Asian Paints and Berger Jenson and Nicholson samples generally exhibited high lead concentration with brighter colors like orange, deep green and red playing the culprits. Even an international brand under the name 'Red Belt Paint Co. Ltd' from USA had 817.29ppm of lead; over nine times that of the US standard.

In the same year, Environment and Social Development Organization (ESDO), Bangladesh undertook a similar study and analyzed 29 decorative paint samples (including 7 brands, 5 non-brands and 17 local brands), that were purchased from different markets of Bangladesh. The samples were tested at the Bangladesh Council of Scientific and Industrial Research (BCSIR) Lab, Dhaka. The simple average lead concentration was found to be 5782.6ppm, while in the branded paint category, Asian Paints (Décor) was found to have lead concentration of 10,800ppm. The simple mean lead content in local and unbranded household paints was 7258.26ppm.

Although it has not been very long since the campaign against lead paint began in the region, the issue has been well publicized by the media



and there has been fair amount of awareness created amongst stakeholders, including the industry and the planners. There has been some positive response from Sri Lanka where our partner the Centre for Environment Justice (CEJ), Colombo has been spearheading the lead-free paint campaign. In a meeting organized by CEJ in November 2010 the paint manufacturers and the government principally agreed to bring down lead levels in decorative paints to 90ppm.

While it's quite unethical for the paint majors to follow differential standards in such matters pleading ignorance or because the nations have different laws, it is also time for governments to set in place legal mechanisms to promote universal best practices. This study examines such issues.

Looking at the overlapping and integrated paint business in the region and growing public health concerns over the use of lead, we decided to take up this study of common paint brands to affirm if the acclaimed and responsible multinationals adhere to comparable standards across countries. In short, whether there is 'double standard'.

Whereas The Blacksmith Institute's World's Worst Pollution Problems Report 2010 indicts lead (Pb) as the deadliest of top six toxic threats globally (and estimates that 18-22 million people worldwide are impacted currently) and the WHO reviewing the current science on lead toxicity, it is widely being accepted that there is 'no safe blood lead level' in humans.





# 3. Scope and Objectives



## 3.1 Focus of the Study

The primary focus of this study is to test the hypothesis whether decorative household paints available in South Asia have varied levels of lead content across identical brands in different countries. Essentially, it would indicate whether the paint majors in this region follow a uniform or comparable standard as far as lead content is concerned. The study also has the scope to provide an indicative summary of whether or not the manufacturers have taken steps to phase-out lead from paints, especially in the light of the fact that the information about lead toxicity and available alternatives is openly available to the public view.

While we ascertain the lead concentration in new decorative paints across known brands, it would also indicate the impact of the 'voluntary' nature of the regulations in South Asia. The present investigation would also suggest the need for a meaningful dialogue on the issue of 'Globally Harmonized Standards System' especially, in matters concerning environment and health. However, the main goal of the study is to advocate a safer public health regime through lead-free paints in the region.

## 3.2 Objectives

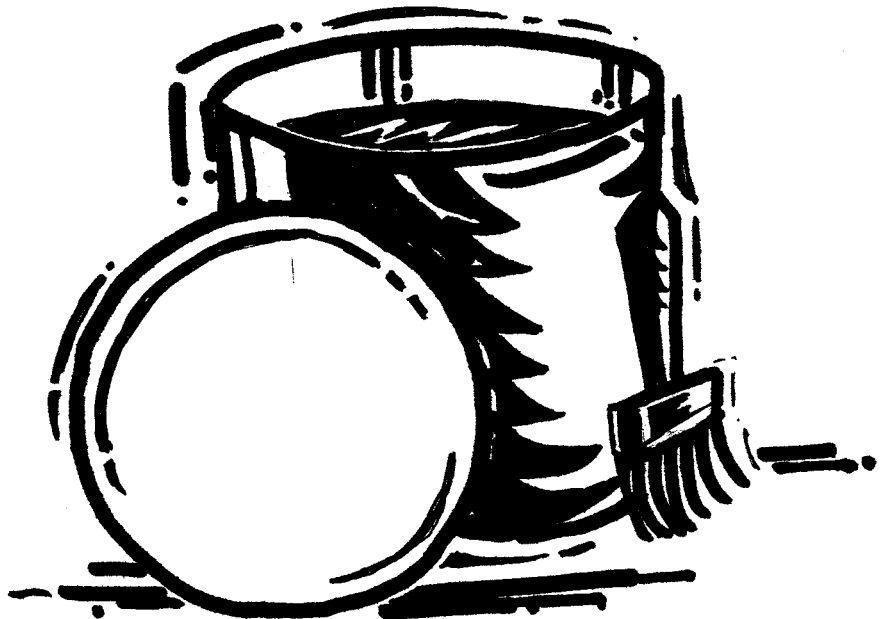
- a. To detect the total lead content in common enamel paint brands (Asian Paints, Berger, Nerolac and ICI Dulux) available in the South Asia region;
- b. To test the hypothesis whether decorative household paints available in the region have a varied level of lead content across identical brands;
- c. To lay stress on the need for a stricter, mandatory and comparable standard for lead in household paints in the region;
- d. To flag-off an effective dialogue on 'Globally Harmonized Standards System (GHS)'
- e. To feed into the larger global goal of having lead-free decorative household paints.

## 3.3 Limitations

Nepal, Bangladesh and India were chosen for this study. Based on market share criteria only the leading paint brands (from the organized sector) that sell by identical names in the region were selected. The study does not venture into other brands available in the region, such as local and unbranded ones. The brands selected were Asian Paints, Berger, Nerolac and ICI Dulux. Paint samples were drawn randomly from the market in respective countries (Table 3). The limitations of this study that emerged

are as follows:

- a. This study pertains only to India, Nepal and Bangladesh. We had also planned to analyze paint samples from Sri Lanka. However, the samples could not be analyzed due to some unforeseen circumstances;
- b. Only four common enamel paint brands having about 80% market share in the region (Asian Paints, Berger, Nerolac and ICI Dulux) were sampled for the study;
- c. The study does not attempt to establish any link with the cross-border trade or other such factors;
- d. The investigation has tried to include latest available paint samples of the aforementioned brands from the three countries. However, since the samples have been randomly picked from the market, identical batch numbers and dates of a particular brand and color could not be obtained. In that sense the study is indicative only;



# 4. Sampling and Analytical Methodology



## 4.1 Materials and Methods

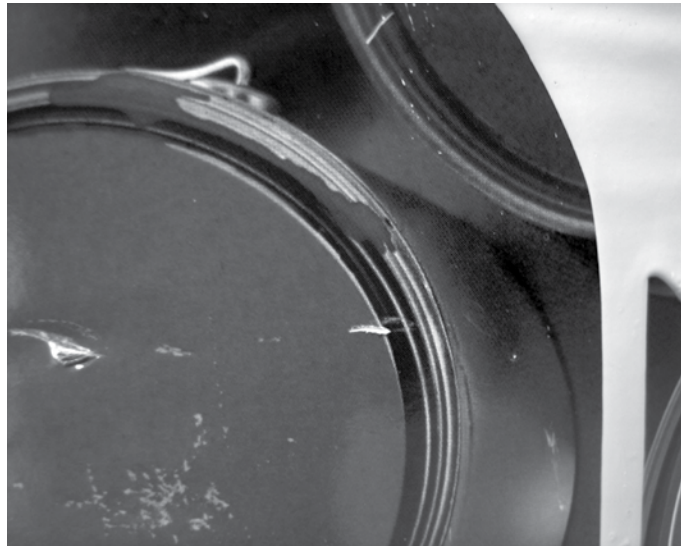
### 4.1.1 Sampling

All the enamel paint samples were randomly picked up from different retail shops in Delhi (India), Kathmandu (Nepal) and Dhaka (Bangladesh) between October 2010 and December 2010. A total of 27 paint samples were collected (9 from India, 12 from Nepal and 6 from Bangladesh) having manufacturing dates between February 2009 and August 2010. The details of paint samples purchased and tested for their lead content are provided in Table 3.

### 4.1.2 Sample Preparation

1. Wet paint samples were applied on to single clean glass surfaces (one sq. feet) using different brushes for each sample to avoid any cross contamination. These samples, thus applied were left to dry for 4 days.
2. After each sample was dry it was scraped off from glass surfaces using a clean sharp knife.

3. The scraped samples were collected in clean polyethylene bags and sent to Delhi Test House (NABL accredited lab – ISO/ IEC 17025:2005), A- 62/3, G.T. Karnal Road, Industrial Area, Opposite Hans Cinema, Azadpur, Delhi- 110033 for further analysis.



**Table 3: Details of Enamel Paint Samples purchased from Nepal, India and Bangladesh markets**

SN	Brand Name	Shade	Manufacturer (with address)	Batch #	Manufacture Date	Purchased from	Pack Volume (ml)
India							
1	Berger (Lewis)	Deep Orange	Berger Paints India Ltd., Berger House, 129 Park Street, Kolkata-700017	A9900	3/2009	Delhi	200
2	Berger (Lewis)	Golden Yellow		A9849	3/2009	Delhi	200
3	Berger (Lewis)	P O Red		710/8339	6/2010	Delhi	200
4	Berger (Lewis)	Bus Green		710/5566	2/2010	Delhi	200
5	Asian Paints #	Golden Yellow	Asian Paints Limited, 6A, Shantinagar, Santacruz (East), Mumbai – 400053	K 497	05/2010	Delhi	500
6	Asian Paints #	P O Red		K 320	04/2010	Delhi	500
7	Kansai Nerolac Paints	Golden Yellow	Kansai Nerolac Paints Ltd., Ganpatrao kadam Marg, Lower Parel, Mumbai 400013	JC	07/2009	Delhi	500
8	Kansai Nerolac Paints *	P O Red		JC	03/2010	Delhi	500
9	Kansai Nerolac Paints	Bus Green		JA	08/2010	Delhi	500
Nepal							
10	Asian Paints	DP Orange	Asian Paint Nepal Pvt Ltd., Hetauda Ind Dist, PO Box No. 37, Hetauda, Nepal	15251	10/2009	Kathmandu	500
11	Asian Paints	Bus Green		18489	Date not mentioned on sticker	Kathmandu	500
12	Asian Paints	Golden Yellow		16569	04/2010	Kathmandu	200
13	Berger Jenson & Nicholson	Cherry	Berger Jenson & Nicholson (Nepal) Pvt. Ltd. SIA Byansi Tole Bhaktapur, Nepal	1948	02/2009	Kathmandu	1000
14	Berger Jenson & Nicholson	Bus Green		B 3274	07/2010	Kathmandu	1000
15	Berger Jenson & Nicholson	Golden Yellow		B 3307	07/2009	Kathmandu	1000

Table 3 Cont...

16	Kansai Nerolac Paints	P O Red	Kansai Nerolac Paints Ltd.,	JC	05/2009	Kathmandu	1000
17	Kansai Nerolac Paints	N. Bus Green	Ganpatrao kadam Marg, Lower Parel, Mumbai 400013	JC	12/2009	Kathmandu	1000
18	Kansai Nerolac Paints	Golden Yellow		JB	12/2009	Kathmandu	1000
19	ICI Dulux	Deep Orange	ICI India Ltd., Infinity Tower A, 7th Floor, DLF Cyber City, Phase II, Gurgaon, Haryana, India	Q08950016	12/2009	Kathmandu	1000
20	ICI Dulux	Green Base		205	03/2010	Kathmandu	1000
21	ICI Dulux	Golden Yellow		Q08936043	08/2009	Kathmandu	1000
<b>Bangladesh</b>							
22	Berger Robbialac	Tanger Ine	Barger Paints Bangladesh Limited Berger House House# 8, Road# 2, Sector# 3 Uttara Model Town Dhaka-1230, Bangladesh	BO/1968	07/2010	Dhaka	500
23	Berger Robbialac	Golden Yellow		B.O-68625/DEN	08/2010	Dhaka	500
24	Berger Robbialac	Geor Green		HO/10415	08/2010	Dhaka	500
25	Asian Paints, Apcolite	Tanger Ine	Asian Paints (Bangladesh) Ltd.	B/No-K96313	07/2010	Dhaka	1000
26	Asian Paints, Apcolite	Golden Yellow	Plot No. 317-757, Bahadurpur, Gazipur District, Bangladesh.	B/No-C101788	07/2010	Dhaka	500
27	Asian Paints, Apcolite	Geor Green		B/No-C101670	08/2010	Dhaka	500

Note:

#-No added lead, mercury, arsenic and chromium;

\*-No added lead, mercury, chromium, arsenic and antimony

## 4.2 Laboratory methods

Samples were analyzed according to Standard Operating Procedures for Lead in Paint by Hotplate or Microwave-based Acid Digestions and Inductively Coupled Plasma Emission Spectroscopy, EPA, PB92-114172, Sept. 1991; SW846-740 (US EPA, 2001).

1. Scraped samples were crushed using mortar and pestle to make them as homogenous as possible;
2. 1 gm of each sample was weighed out into an acid-washed 100 ml beaker and then digested/extracted;
3. Standards were prepared as per standard protocol.

## 4.3 Digestion Procedures

1. To beakers containing samples and standards 3 ml. of concentrated  $\text{HNO}_3$  and 1 ml of  $\text{H}_2\text{O}_2$  were added and then covered with a ribbed watch glass;
2. Samples and standards were then heated on a hotplate at 1400 Centigrade until most of the acid evaporated. Then they were removed from the hotplate and allowed to cool at room temperature;
3. Then 2 ml of  $\text{HNO}_3$  and 1 ml 30%  $\text{H}_2\text{O}_2$  were added into the beakers and dried on a hotplate till dry and then allowed to cool;
4. Step 3 was repeated once again;
5. The watch glass and walls of the beaker were rinsed with 3 to 5 ml of 1M  $\text{HNO}_3$ . The solution was allowed to evaporate gently till it was dry and then removed from the heat and cooled;
6. To the residue 5 ml of concentrated  $\text{HNO}_3$  were added and the samples were then swirled for a minute or so to dissolve soluble species;
7. Samples were then poured from the beaker into a labeled volumetric flask. The samples were brought up to 100 ml volume by adding Double Distilled Water and mixed vigorously;
8. Digested samples were then analyzed for total lead (Pb) in Thermo 61E Trace Inductively Coupled Plasma (ICP) Spectrometer;



# 5. Results and Discussion



## 5.1 Broad Overview of Results

We looked at two clear benchmarks for us to compare the lead concentrations in enamel samples studied, a) the US 90ppm limit and b) the IS voluntary standard of 1000ppm, the only available standard in selected countries for the study.

The lead concentration in each sample studied is tabulated in Table 4. It's clear that out of 27 samples, 12 samples (S.No 1-12 in Table 4) that exceeded the Indian standard of 1000ppm, show very high concentrations of lead in them, in the range of 1,920ppm (Apcolite Gloss, Tanger Ine from Asian Paints, Bangladesh) and 2,12,700ppm (Golden Yellow from Berger Jenson & Nicholson, Nepal). Their collective average lead concentration has been 53,801.66ppm, 54 times

higher than the IS 1000ppm standard.

Seventeen (63% of total) samples were found to be exceeding the limit of 90ppm US standard, collectively 422.5 times higher than the said limit. The lead concentrations in these 17 samples were between 90ppm and 2,12,700ppm with the collective simple mean concentration recorded as 38,027ppm

While 10 samples (37% of the total) were found to be having lead concentrations below 90ppm (simple average 56.24ppm), the overall average lead concentration for all samples is 23963.79ppm, 266 and 24 times the US and IS standards respectively (Table 4).

The lowest lead concentration (7.5ppm) was found in Asian Paints (India) with PO Red shade. However, in general ICI and Nerolac samples were found to be the cleanest across the selected countries.

**Table 4: Lead concentration in tested sample**

SN	Brand Name	Shade	Sample from	Lead concentration (ppm)	Multiple of 90ppm (US)	Multiple of 1000ppm (IS)
<b>Seventeen samples exceeding 90ppm (US standard) mark</b>						
1	Berger Jenson & Nicholson	Golden Yellow	Nepal	2,12,700	2363	213
2	Berger Robbialac	Golden Yellow	Bangladesh	1,21,900	1354	122
3	Asian Paints	DP Orange	Nepal	64,400	716	64

Table 4 Cont...

4	Berger Jenson & Nicholson	Bus Green	Nepal	49,700	552	50
5	Asian Paints, Apcolite	Golden Yellow	Bangladesh	43,600	484	44
6	Berger Robbialac	Tanger Ine	Bangladesh	36,700	408	37
7	Berger (Lewis)	Deep Orange	India	34,700	386	35
8	Berger Robbialac	Geor Green	Bangladesh	31,000	344	31
9	Asian Paints, Apcolite	Geor Green	Bangladesh	18,600	207	19
10	Berger (Lewis)	Golden Yellow	India	17,200	191	17
11	Berger Jenson & Nicholson	Cherry	Nepal	13,200	147	13
12	Asian Paints, Apcolite	Tanger Ine	Bangladesh	1,920	21	2
Average of 12 samples exceeding 1000ppm				53,801.66	598	54
13	Kansai Nerolac Paints	N. Bus Green	Nepal	270	3	0.27
14	Asian Paints	Bus Green	Nepal	190	2	0.19
15	Asian Paints	Golden Yellow	Nepal	190	2	0.19
16	Kansai Nerolac Paints	Golden Yellow	Nepal	100	1	0.1
17	Asian Paints	Golden Yellow	India	90	1	0.09
Average of 17 samples exceeding 90ppm				38,027	422	38
Samples where lead concentration found below 90ppm						
18	Kansai Nerolac Paints	Bus Green	India	80	0.89	0.08
19	Berger (Lewis)	Bus Green	India	70	0.78	0.07
20	Kansai Nerolac Paints	P O Red	India	70	0.78	0.07
21	ICI Dulux	Green Base	Nepal	70	0.78	0.07
22	ICI Dulux	Deep Orange	Nepal	66	0.73	0.07
23	Kansai Nerolac Paints	P O Red	Nepal	65	0.72	0.07
24	Berger (Lewis)	P O Red	India	62	0.69	0.06



Table 4 Cont...

25	ICI Dulux	Golden Yellow	Nepal	60	0.67	0.06
26	Kansai Nerolac Paints	Golden Yellow	India	12.3	0.14	0.01
27	Asian Paints	P O Red	India	7.5	0.08	0.01
Average of 10 samples below 90ppm				56.24	0.62	0.06
Average of all samples				23,963.79	266	24

## 5.2 Colours and Brands

The shades of yellow and orange exhibited comparatively higher lead concentration having a cumulative average of 48,500ppm across brands, 538 times the US mark and 48.5 times the IS mark (Table 5). In this study,

65% samples were of the above shades. Green shade followed with an average lead concentration of 19,952ppm, 222 times the US mark and 20 times the IS mark. The Cherry shade of Berger, Nepal too had a huge amount of lead concentration (13,200ppm), 147 times the US mark and 13.2 times the IS mark.

Table 5: Colour Culprits

SN	Shade	% of samples exceeding 90ppm limit	Average Lead concentration (ppm)	Multiple of 90ppm (US)	Multiple of 1000ppm (IS)
1	Yellow/ Orange	65	48,500	538.88	48.5
2	Greenish	30	19,952	222	20
3	Cherry	5	13,200	147	13

Brand-wise, the Berger samples cutting across countries were found to have lead in quite high proportion compared to other brands and the available reference standards. Berger samples had a cumulative average of 51,723.2ppm lead (Table 6) across countries and shades, a whopping 575 times higher than US standard and 52 times the IS standard.

to be fairly below the reference standards. While the ICI average is 65.33ppm Nerolac recorded a slightly higher mean concentration of 99.55ppm (average shot up for Nerolac due to Nepal samples which had 270ppm and 100ppm respectively).

Asian Paints samples with 16,124.7ppm cumulative average have been the next to follow. Although, their cumulative concentration has been far below the Berger samples, they still exceed the US and IS standards by a big margin (179 and 16 times; Table 6).

The cumulative average lead concentration in ICI Dulux and Nerolac samples were found

Brand	% of total samples tested	Mean ppm lead	Multiple of 90ppm (US)	Multiple of 1000ppm (IS)
Berger	37	51,723.20	574.70	51.72
Asian Paints	30	16,124.64	179.16	16.12
Kansai Nerolac Paints	22	99.55	1.11	0.10
ICI Dulux	11	65.33	0.73	0.07

## 5.3 Country Perspective

### 5.3.1 Bangladesh

While Berger and Asian Paints control the paint market in Bangladesh with about 60-65% market share, the lab results show that both these brands across shades exhibit very high lead concentration with the mean at 42,286ppm. While Berger samples had an average concentration of 63,200ppm, over 700 times multiple of US standard, Asian Paints exhibited an average 21,373ppm lead content in their samples, about 237 times multiple of US standard. The cumulative average lead concentration of all Bangladesh enamel paint samples (42,286ppm, 469.8 times higher than US standard of 90ppm) is much higher than the Nepalese and Indian samples (Table 7). Ironically, both Berger and Asian Paints claim to sell lead-free decorative paints in Bangladesh.

### 5.3.2 Nepal

The cumulative mean lead concentration of all samples from Nepal is 28,417.6ppm, 315.8 times higher than US standards. While Berger and Asian Paints have exceeded the US standard mark by whopping 1021 and 240 times respectively, the ICI samples (with 65ppm cumulative mean) exhibited far below 90ppm concentration. Nerolac exceeded the US mark by about 55ppm (with 145ppm cumulative mean; Table 7). Both Nerolac and Asian Paint however claim to be selling lead-free paints in Nepal.

### 5.3.3 India

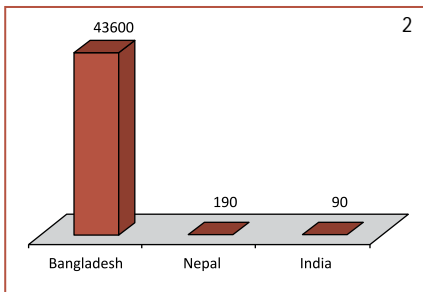
In nine samples from India the average lead concentration has been found to be 5,810ppm, courtesy Berger samples that exhibited a whopping 13,008ppm mean lead concentration (Table 7), 145 times the US standard and 13 times the IS standard. All other paint samples of Asian Paints and Nerolac were found to be far below the 90ppm mark. Not taking into account the Berger samples, the average lead concentration in Indian samples would be about 52ppm only.

Brand Name	Samples (#)	Lead concentration (ppm)	Multiple of 90ppm (US)	Multiple of 1000ppm (IS)
<b>Bangladesh</b>				
Berger Robbialac	3	63,200	702	63
Asian Paints, Apcolite	3	21,373	237	21
Mean lead concentration	6	42,286.7	469.8	42.2

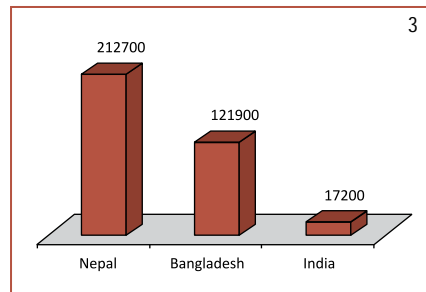
Table 7 Cont...

Nepal				
Berger Jenson & Nicholson	3	91,867	1021	92
Asian Paints	3	21,593	240	22
Kansai Nerolac Paints	3	145	2	0.15
ICI Dulux	3	65	1	0.07
Mean lead concentration	12	28,417.6	315.8	28.4
India				
Berger (Lewis)	4	13,008	145	13
Kansai Nerolac Paints	3	54	1	0.0541
Asian Paints	2	49	1	0.049
Mean lead concentration	9	5,810.16	64.6	5.8

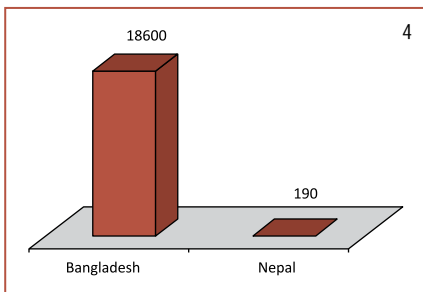
Figure 2-7: Lead Concentration (ppm) Across Brands - Evidence of Double Standard



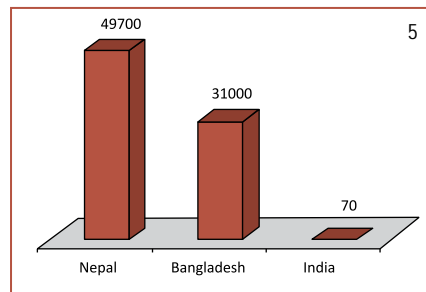
Asian Paints (Golden Yellow shade)



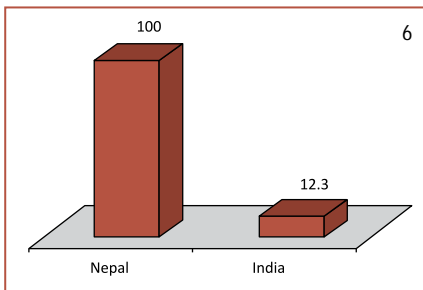
Berger (Golden Yellow shade)



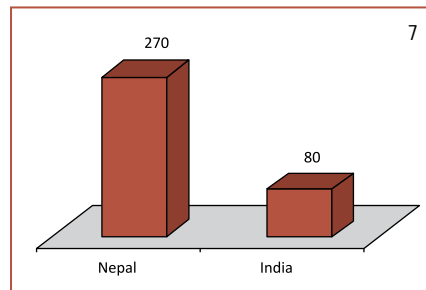
Asian Paints (Green shade)



Berger (Green shade)



Nerolac (Golden Yellow shade)



Nerolac (Green shade)

## 5.4 Regional Perspective – Evidences of manufacturer's Double Standard

Whereas, the degree of concentration of lead in enamel paints is particularly high in all shades of yellow and orange there is a clear regional trend; Berger and Asian paints do seem to follow clear differential standards depending upon which country they are operating in. Even Nerolac, that generally exhibited <90ppm lead concentration in India, fails to adhere to this standard when it comes to Nepal (this is strange as the Nerolac paints are exported to Nepal from India).

However, as mentioned above, the differential standards in Asian Paints and Berger are quite pronounced in the selected countries. For example Asian Paints, which has quite a low lead concentration in Indian samples (90ppm and 7.15ppm), in Bangladesh and Nepal, the brand exhibits a very high and quite unacceptable lead content. None of the Asian Paint samples confirm to 90ppm levels in Bangladesh and Nepal. In fact the average lead concentration of lead in Asian Paints (Bangladesh and Nepal) samples is 21483.3ppm, 238 times 90ppm standard. Comparing the common shades of Golden yellow, the Asian Paint, India contains 90ppm while in Nepal the same shade has 190ppm and in Bangladesh it has 43,600ppm exhibiting clear differential standards that have been followed by them.

Figures 2-7 clearly depict the differential standards followed by major brands in the region. Although it is surprising that Nerolac, which is exported from India to Nepal has different lead concentration across green and yellow shades (fig 6 and 7)

The results obtained are a clear indication that there is a need to have comparable and mandatory standards for lead in decorative paints in the region. There is also a growing realization that it

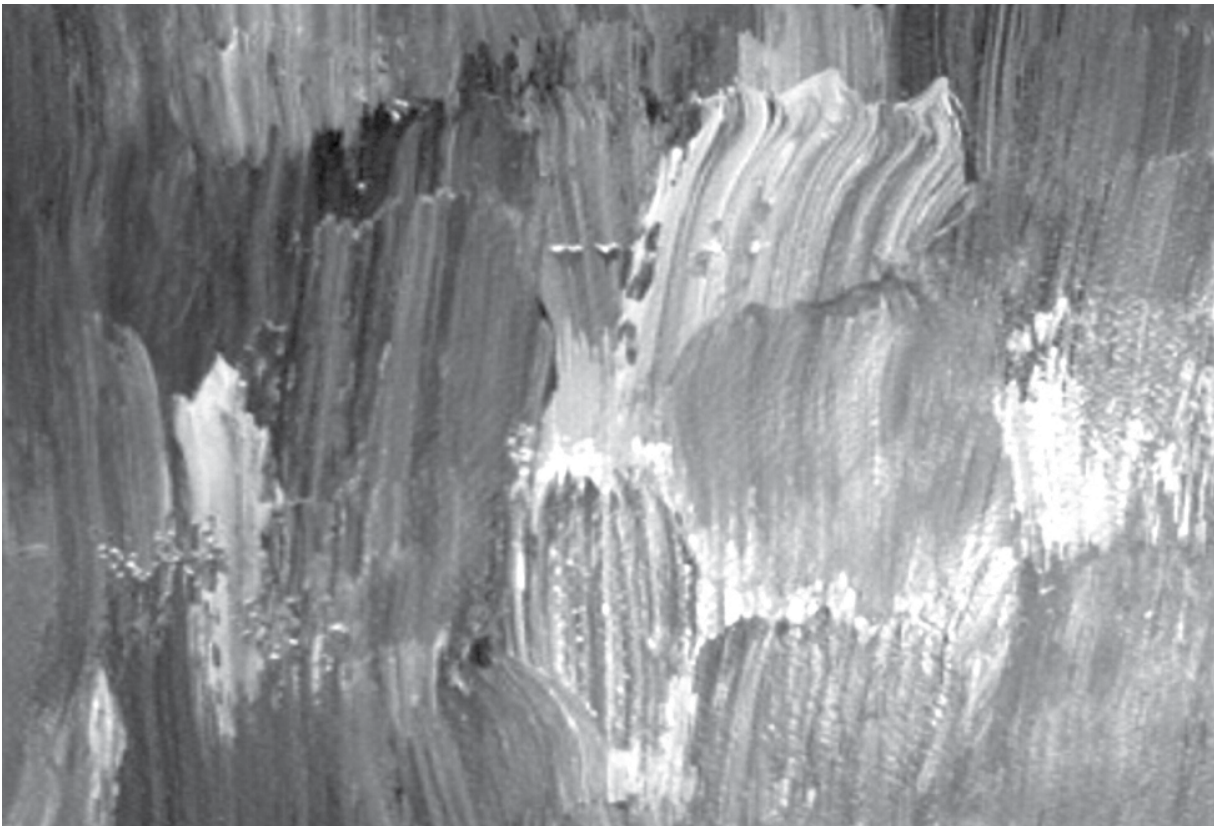
is time for integrating the national standards in the region with the Globally Harmonized Standards System (GHS), especially in matters concerning environment and public health.

## 5.5: Key Findings from the lab tests

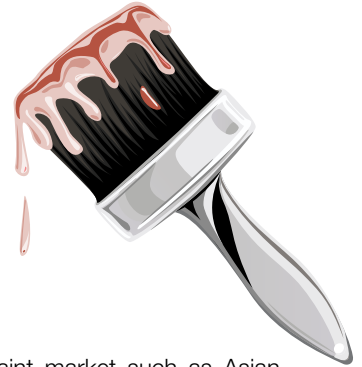
- a. Seventeen samples (63% of total of 27) found to be exceeding the US standard limit of 90ppm. They cumulatively exceed the US standard by 422 times;
- b. Twelve samples (44% of total of 27) collectively exceed the limit of 1000ppm (IS standard) by over 54 times;
- c. The top three samples containing the highest lead concentrations are –
  - i. Berger, Golden Yellow - Nepal - 2,12,700ppm;
  - ii. Berger Robbialac, Golden Yellow – Bangladesh - 1,21,900ppm;
  - iii. Asian Paint, DP Orange – Nepal - 64,400ppm;
- d. Overall, yellow and orange samples have been found to have the maximum lead concentration with a cumulative average of 48,500ppm across brands;
- e. Brand-wise, Berger samples exhibited the maximum lead concentration with a cumulative average of 51,723.2ppm across countries for various shades. This has been followed by Asian Paints with 16,124.7ppm (cumulative mean). ICI Dulux emerged the cleanest with 65.33ppm mean lead concentration, much below US's 90ppm limit;
- f. The lowest lead concentration however was found in Asian Paints, P O Red shade manufactured in India with 7.15ppm;
- g. Country-wise, paint samples from Bangladesh exhibited the highest lead concentration (cumulative average 42,286.6ppm), followed by Nepal with a cumulative average of 28417.6ppm lead concentration. Indian

enamel paint samples had the least average concentration across brands (average 5810ppm) However, Berger's Indian samples showed a high cumulative average of 25,950ppm across various shades.

- h. The regional comparisons across brands and shades confirm clear differential standards followed by most of the paint manufacturers. However the variations in lead concentration across identical shades from Berger and Asian Paints have been more pronounced.



# 6. Conclusions



The following inferences can be drawn from the above discussions:

- a. The household paint business in the region is growing at double digits annually and due to rapid economic development and still low per capita paint consumption (of less than a kilogram), there is a huge scope for further expansion of the paint business;
- b. Asian Paints, Berger, ICI and Nerolac are the clear market leaders in the region with 60-90% market share;
- c. The regulation of lead in paints in the region is quite lax with countries like Nepal and Bangladesh having no legal mechanism to address this issue;
- d. While, tall claims have been made by paint majors regarding their voluntary move to sell lead-free decorative paints, independent studies suggest that the majority of them still enjoy the regulatory system with its many loopholes;
- e. Leaders in the paint market such as Asian Paints and Berger seem to follow clear differential standards regarding lead. The following facts confirm the hypothesis of double standard followed by paint companies-
  - i. Asian Paints and Berger claim to have gone lead free in the region. However, Berger, being a group associate of Asian Paints still adds a huge amount of lead in paints meant for Indian consumers while Asian Paints have gone lead-free;
  - ii. Different shades of Asian Paints from Bangladesh exhibit high levels of lead;
  - iii. There is also high but differential lead levels in Berger and Asian Paints samples from Bangladesh;
  - iv. Nerolac samples from Nepal (exported from India) have higher lead content compared to Nerolac samples from India.

# 7. Recommendations



## 7.1 Regulation

- a. The use of lead in paints is not regulated in most of the developing countries (Toxics Link 2009). The present study too suggests that in South Asia the standards are either voluntary or there is no legal framework for restricting lead level in paints. There is a need for formulating stricter and mandatory standards for lead in paints for the following good reasons:
  - i. There is an ever increasing market for decorative household paints in the region;
  - ii. The impact of lead poisoning has been well established, especially in children and unborn foetuses; and,
  - iii. Since the voluntary standards have been blatantly ignored by most in the industry, there is a need for legal and regulatory deterrents;
- b. There is a need to have comparable standards across different countries in this region as we are closely knit nations with overlapping business interests and growing public health concerns;
- c. In matters of public health and environment it is imperative to initiate steps towards a Globally Harmonized Standards System. Public health must be attended to as a priority universally. Possibly forums like SAARC (South Asian Association for Regional

Cooperation) could be engaged as far as this region is concerned;

## 7.2 Corporate Responsibility and Government Action

- a. The paint manufacturers must immediately shift to a lead-free regime across the region. They must stop pushing their products to new corners of the world where the issue is less known. Double Standard by them is not acceptable.
- b. While the industry works out the technological leapfrog, the governments must lay down effective guidelines for manufacturers and users to minimize the toxic trail and impact;
- c. The manufacturers must share the market intelligence and information with the public;
- d. Governments need to initiate effective monitoring. This is specifically essential as there is large number of small manufacturers in this sector;
- e. The governments must (till the time the regulations are enforced) notify through a circular that educational institutions, especially schools and play houses for kids, must use only the lead free paints available in the market;



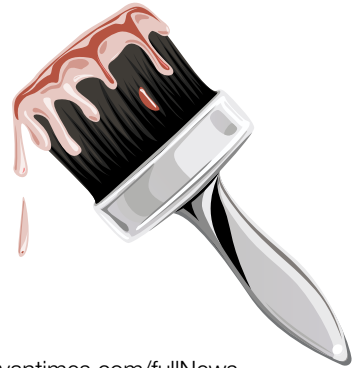
## 7.3: Concerted Global Action and Stakeholders Involvement

- a. The global partnership on lead in paints formed under UNEP and WHO at 2009 May at ICCM2 should be further strengthened and all national governments and industry must support this effort;
- b. Every other stakeholder such as the civil societies, educationists, healthcare professionals and media etc., must come forward for spreading mass awareness on this issue.





# 8. End Notes



- 1 [http://www.telegraphindia.com/1110131/jsp/atleisure/story\\_13514264.jsp](http://www.telegraphindia.com/1110131/jsp/atleisure/story_13514264.jsp)
- 2 Lead In New Decorative Paints, Toxics Link, 2009, A Brush with Toxics, Toxics Link, 2007, National Chemical Management Profile For India, MoEF/CPCB, Government of India, [www.bergerpaints.com](http://www.bergerpaints.com), <http://www.asianpaints.com>, [www.nerolac.com](http://www.nerolac.com), [www.delhipaints.com](http://www.delhipaints.com), [http://www.domain-b.com/industry/paints/200012\\_paint\\_overview.html](http://www.domain-b.com/industry/paints/200012_paint_overview.html), 2006 mineral yearbook, USGS, [www.britannica.com](http://www.britannica.com), [www.paintindia.in](http://www.paintindia.in), <http://www.docstoc.com/docs/15229858/paint>, [www.thefreelibrary.com](http://www.thefreelibrary.com), [www.ipen.org](http://www.ipen.org)
- 3 Reproduced by encyclopedia Britannica -<http://www.britannica.com/bps/additionalcontent/18/32848935/World-Paint-Statistics>
- 4 Some sources like [http://www.domain-b.com/industry/paints/200012\\_paint\\_overview.html](http://www.domain-b.com/industry/paints/200012_paint_overview.html) suggest the average to be about 15kgs/capita
- 5 [http://www.paintindia.in/paintindia/pages/Paintindia\\_Indian\\_Coatings\\_Industry\\_Profile\\_2009.pdf](http://www.paintindia.in/paintindia/pages/Paintindia_Indian_Coatings_Industry_Profile_2009.pdf)
- 6 <http://www.hinduonnet.com/businessline/2001/06/16/stories/02161880.htm>
- 7 <http://www.thehimalayantimes.com/fullNews.php?headline=Berger%2C+Asian+Paints+lead+the+paints+market&NewsID=246376>
- 8 The Financial Express, Dhaka, Wednesday June 16 2010 [http://www.thefinancialexpress-bd.com/more.php?news\\_id=103277](http://www.thefinancialexpress-bd.com/more.php?news_id=103277)
- 9 <http://www.thedailystar.net/newDesign/news-details.php?nid=123176>

# 9. Bibliography



1. A Brush with Toxics, Toxics Link, 2007
2. American Journal of Public Health, 1923. Prohibition of white lead in Belgium. 13. 337
3. Clark, C.S., Bornsheim, R.L., Succop, P., Que Hee, S.S., Hammond, P.B. and Peace, B., 1985. Condition and Type of Housing as an indicator of potential Environmental Lead Exposure and Pediatric Blood Lead Levels. Environmental Research. 38, 46-53
4. <http://cseindia.org/node/500>
5. <http://dipp.nic.in>
6. <http://moef.nic.in>
7. <http://www.asianpaints.com>
8. <http://www.asianpaints.com/applications/decorative.aspx>
9. <http://www.bis.org.in>
10. <http://www.britannica.com/bps/additionalcontent/18/32848935/World-Paint-Statistics>
11. <http://www.docstoc.com/docs/15229858/paint>
12. [http://www.domain-b.com/industry/paints/200012\\_paint\\_overview.html](http://www.domain-b.com/industry/paints/200012_paint_overview.html)
13. <http://www.hinduonnet.com/businessline/2001/06/16/stories/02161880.htm>
14. [http://www.paintindia.in/paintindia/pages/Paintindia\\_Indian\\_Coatings\\_Industry\\_Profile\\_2009.pdf](http://www.paintindia.in/paintindia/pages/Paintindia_Indian_Coatings_Industry_Profile_2009.pdf)
15. [http://www.telegraphindia.com/11110131/jsp/atleisure/story\\_13514264.jsp](http://www.telegraphindia.com/11110131/jsp/atleisure/story_13514264.jsp)
16. [http://www.thefinancialexpress-bd.com/more.php?news\\_id=103277](http://www.thefinancialexpress-bd.com/more.php?news_id=103277)
17. <http://www.thefreelibrary.com/Pakistan+paint+industry+feature.-a0225590058>
18. <http://www.thehimalayantimes.com/fullNews.php?headline=Berger%2C+Asian+Paints+lead+the+paints+market&NewsID=246376>
19. Lead In New Decorative Paints, Toxics Link, 2009
20. Lin-Fu, J. S., 1967. Lead poisoning in children. Social and Rehabilitations Service. U.S. Department of Health, Education and Welfare. Children's Bureau Publication 452, U.S. Government Printing Office, Washington, D.C., as cited in Clark et al., 1985
21. National Chemical Management Profile For India, MoEF/CPCB, Government of India
22. paintindia, snapshot of Indian coatings industry, 2009
23. World's Worst Pollution Problems Report 2010, Blacksmith Institute
24. [www.asianpaints.com](http://www.asianpaints.com)
25. [www.bergerpaints.com](http://www.bergerpaints.com)
26. [www.britannica.com](http://www.britannica.com)
27. [www.delhipaints.com](http://www.delhipaints.com)
28. [www.nerolac.com](http://www.nerolac.com)
29. [www.paintindia.in](http://www.paintindia.in)
30. [www.thefreelibrary.com](http://www.thefreelibrary.com), [www.ipen.org](http://www.ipen.org)
31. 2006 mineral yearbook, USGS





Toxics Link  
for a toxics-free world

**DELHI**

H-2, (Ground Floor), Jangpura Extension, New Delhi - 110014

T: +91-11-24328006, 24320711 F: +91-11-24321747 E: [info@toxicslink.org](mailto:info@toxicslink.org)

**CHENNAI**

9/5 (2nd Floor), Second Street, Padmanabha Nagar, Adyar, Chennai 600 020.

T: +91-44-42607642 E: [tlchennai@toxicslink.org](mailto:tlchennai@toxicslink.org)

**KOLKATA**

15/2/25A, Sweet Land, Jhil Road, Kolkata - 700075.

T: 033-32023410

[www.toxicslink.org](http://www.toxicslink.org)