

How safe is your paint?

Compliance of Lead in Paint
regulations in India

2020



A study by



Toxics Link
for a toxics-free world

ABOUT TOXICS LINK

Set up in 1996, Toxics Link is an Indian environmental research and advocacy organization engaged in disseminating information to help strengthen the campaign against toxics pollution, provide cleaner alternatives and bring together groups and people affected by the problem. Toxics Link's Mission Statement is: "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." The organisation's unique expertise lies in the areas of hazardous, medical and municipal waste, international waste trade, and the emerging issues of pesticides, Persistent Organic Pollutants (POPs), hazardous heavy metal contamination etc. from the environment and public health point of view. We have successfully implemented various best practices and have brought in policy changes in the aforementioned areas apart from creating awareness among several stakeholder groups.

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Introduction

1.1. About Lead in paints

Lead is a heavy metal naturally found in the Earth's crust. It has many commercial uses, such as manufacturing of lead-acid batteries, addition in pigments and paints, solder, ammunition, ceramic glazes, jewellery, toys and also in some cosmetics and traditional medicines. Lead has been found to be commonly used in household paints since ages giving rise to **"Lead-laden paints" or "Lead Paint"**. Lead paint is paint or a similar coating material to which one or more lead compounds have been added¹. Lead compounds are generally added to paints to give them certain properties such as color, shine, durability and reduced corrosion on metal surfaces or faster drying time. For the same reasons, lead compounds may be present in other types of coatings, including varnishes, lacquers, enamels, glazes and primers. Lead additives are most commonly used in solvent-based paints due to their specific chemical properties and such solvent-based lead paints and coatings are still widely available and used in many countries. Water-based latex paint, on the other hand, rarely contains intentionally added lead compounds. The most commonly used lead pigments are lead chromates and lead molybdates which are bright yellow, orange or red in color².

- 1 Model Law and guidance for regulating lead paint, The United Nations Environment Programme Revised July 2018
- 2 http://wedocs.unep.org/bitstream/handle/20.500.11822/14806/module_ai_lead_paint_v5%20Feb%202017.pdf?sequence=1&isAllowed=y

1.2. Household paints and Lead poisoning

Lead poisoning occurs due to excessive exposure of lead to humans. The most common route of exposure is found to be ingestion. Lead is ingested mostly by young children by a common practice of licking the doors and windows or eating dried paints. Exposure to lead occurs over a short space of time (acute poisoning) or over a prolonged period (chronic poisoning). No safe level of exposure to lead has so far been identified³. However, some health authorities have defined excessive exposure when the blood lead level exceeds 5 µg/dL in children less than six years of age⁴.

Lead poisoning mostly occurs due to dried off paints, as they start to decay and their dust contaminates the entire environment putting human health at risk. The removal of lead paint is another major reason for increased lead concentration in the home environment, if not done in a safe manner. Lead paints can remain a source of exposure for many years into the future. Even in countries that banned lead paint decades ago there are still many homes where lead painted surfaces can be found⁵.

1.3. Lead and health impacts

Lead is a cumulative toxicant that poses serious risks to the environment and human health. The World Health Organization⁶ lists lead exposure as one

of the top ten environmental health threats globally. Lead accumulates in the body and affects practically all organ systems⁷. Young children and pregnant women are most vulnerable to lead poisoning even at low concentrations because the nervous system of the child is in a developing stage. Children getting exposed to lead in early childhood are prone to reduction in cognitive abilities, dyslexia, attention deficit disorder and antisocial behavior. Lead exposure can also lead to hypertension, renal impairment, immunotoxicity and toxicity to the reproductive organs. Absorption of large amounts of lead can cause coma, convulsions and even death. Children who survive severe lead poisoning can be left with permanent neurological injury such as deafness and mental retardation⁸.

Though, lead poisoning is preventable, the Institute for Health Metrics and Evaluation has estimated that, based on 2016⁹ data, lead exposure accounted for 5,40,000 deaths and 13.9 million years lost to disability and death due to long-term effects on health, with the highest burden being in the developing regions.

In India, the health impacts of the toxic metal were recorded as early as 1999, when a study by George Foundation revealed that over 51% of the children below the age of 12 years living in major urban areas of India had unacceptably elevated levels of lead in blood of 10 µg/dL or more. A number of studies followed

3 http://www.who.int/ipcs/lead_campaign/QandA_lead_2017_en.pdf

4 http://www.who.int/ipcs/lead_campaign/QandA_lead_2017_en.pdf

5 http://www.who.int/ipcs/lead_campaign/QandA_lead_2017_en.pdf

6 WHO, 2015

7 http://www.who.int/ipcs/lead_campaign/QandA_lead_2017_en.pdf

8 http://www.who.int/ipcs/lead_campaign/QandA_lead_2017_en.pdf

9 http://www.who.int/ipcs/lead_campaign/en/

since then and a study by Nichani. et. al., 2006 and Singh & Singh 2006 pointed out to the reduction in lead poisoning after The Government of India imposed a ban on use of leaded gasoline (petrol) in 2000. Still in 2003, 33.2% of the 754 children that were tested in Mumbai had blood lead levels of C10 µg/dL (Nichani. et. al., 2006). In yet another study conducted among 107 school children-in Mangalore, India, Kuruvilla.et. al., 2004 has identified lead in paints as the likely source of exposure for 10 children with blood lead levels above 40 µg/dL¹⁰.

Subsequently on 31st October, 2017, the Central Pollution Control Board notified the Procedure for Measurement of Lead contents in Household and Decorative Paints- rules explaining the applicability, requirements and testing procedure for the Lead in Paint Regulations. The document provides details on the assessment of existing and new paints besides providing the-sampling and testing protocol. It also entails the procedure for analysis of Lead in Paint and prescribes accredited labs for testing, implementation and monitoring.

1.4. Status of Lead in paints in India

1.4.1 Lead in Paints Regulation

The government of India notified the **“Regulation on Lead contents in Household and Decorative Paints Rules, 2016”** on 1st November, 2016 which came into force from 1st November, 2017¹¹.

Salient features of the regulations are:



Prohibition:

Prohibition of manufacturing, trade, export and import of household and decorative paints containing metallic lead in concentration exceeding 90 parts per million.



Self-Certification:

Household and decorative paints manufactured or imported after November, 2017 should have the label: “Lead contents do not exceed 90 parts per million” along the manufacturing/importing date.



Transitory Provision:

A time period of two years had been allotted to paint manufacturers before the commencement of the rules to sell off old stock and further comply with the legislations.



Testing:

The manufacturers and importers are also required to get their products tested once a year before putting them in the supply chain. The rules have also identified The Central Power Research Institute as the authorized testing agency.

1.4.2 Efforts to eliminate lead from Paints

The issue of Lead in paints was never discussed in India until 2007 when Toxics Link did the first-of-its-kind study on it. The study reflected a grim scenario as high content of Lead in the paints was detected in almost all the brands. Subsequently, Toxics link carried out a number of studies and found that though the major

¹⁰ Lead Content in New Decorative Paints in India, 2013

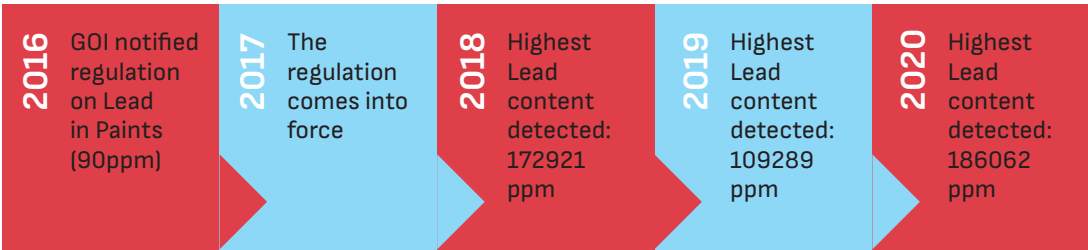
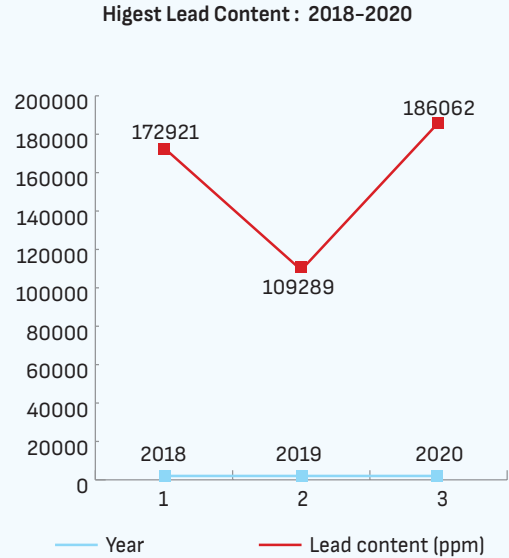
¹¹ http://www.moef.nic.in/sites/default/files/final%20notification_Lead%20in%20Paints.pdf

manufacturers have shifted to lead-free paints there are still concerns on the use of Lead in paints by the small and medium scale enterprises.

Finally the Government of India acted upon the issue and it notified the “Regulation on Lead contents in Household and Decorative Paints Rules, 2016” on 1st November, 2016 which came into effect from 1st November, 2017¹².

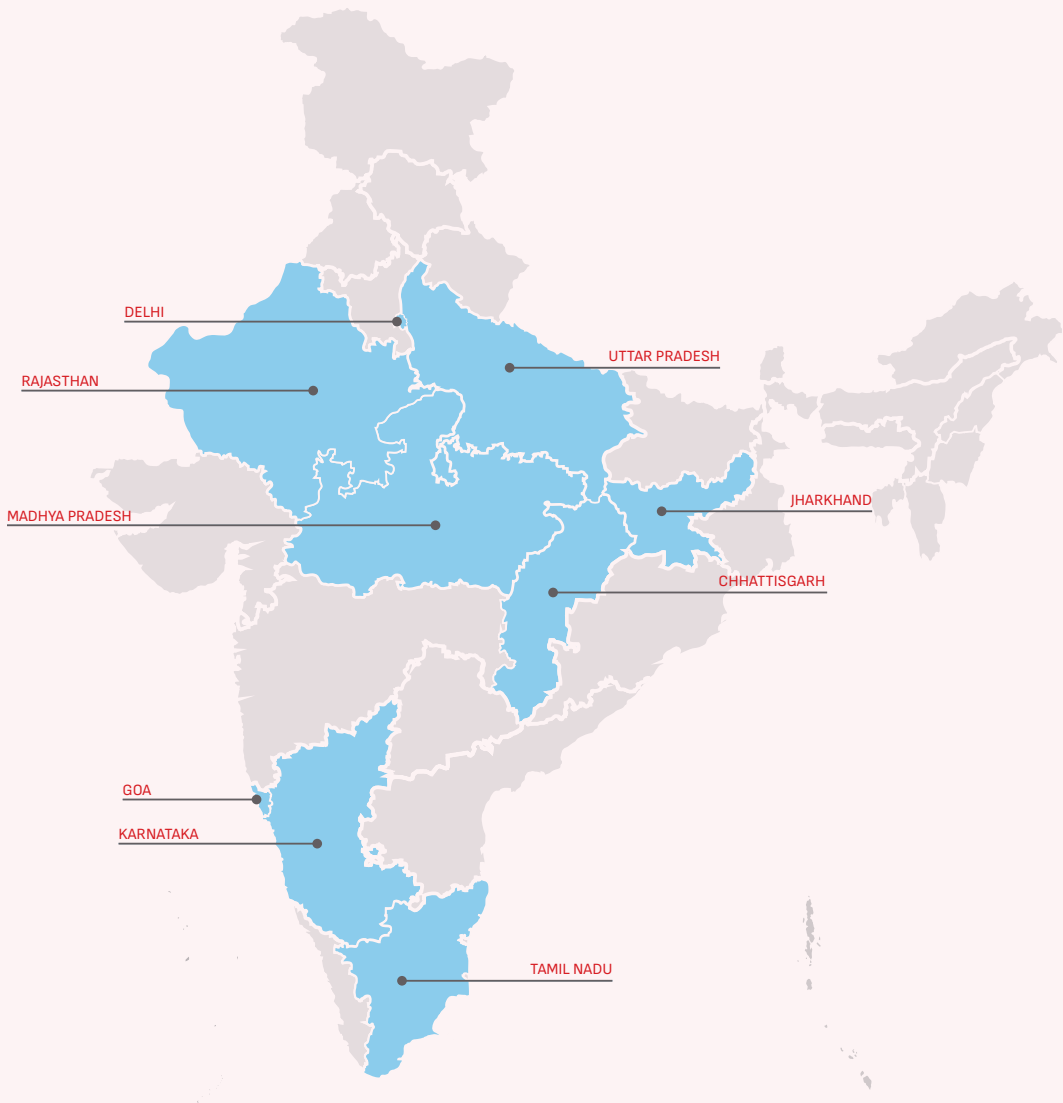
Since 2017, Toxics Link has been conducting studies every year to analyze the implementation status of the Lead in Paint regulations. A series of reports have pointed out to minimal progress by the SMEs in eradicating the hazardous heavy metal from their paints. The following trend depicts a clear pattern of high level of lead content in paints purchased across the country in the last three years.

Figure 1 Lead content in paints from 2018–2020



12 http://www.moef.nic.in/sites/default/files/final%20notification_Lead%20in%20Paints.pdf

Research Methodology



2.1 Importance of the study

The current study was conducted in the context of ongoing efforts of Toxics Link to phase out Lead from decorative paints in the country. Further objective of the study was to check the compliance status of lead in paints regulations in the country. The study was aimed to create information on the present scenario of paints containing Lead which are available in Indian markets and can be used as a yardstick to improve the compliance of the regulations in the country.

2.2 Study Locations

Toxics Link with the help of partner NGOs conducted a brief survey of the paint markets in different parts of the country. The survey was undertaken in the states of Chhattisgarh, Delhi, Goa, Jharkhand, Karnataka, Madhya Pradesh, Rajasthan, Tamil Nadu and Uttar Pradesh to identify the brands which are commonly available in the market. After identification of the brands, enamel paint samples were collected from all these states between November 2019 and January 2020.

2.3 Testing Protocol

During the paint sample preparation, information such as color, brand, country of manufacture, purchase details and manufacturing date as provided on the label of the paint can were recorded. The availability of the paints in retail establishments suggested that they were intended to be used for homes. For the purpose of testing bright and dark colours such as yellow, green, red, gold, lily, etc. were selected.

Each can of paint was thoroughly stirred and was subsequently applied onto individually numbered specific sized transparent glass plates. Each stirring utensil and paintbrush was used only once, and extra caution was taken to avoid cross contamination. All samples were kept in a closed room till they were completely dried and after complete drying, the glass plates were placed in individual resealable plastic bags and sent to an NABL accredited laboratory (SPECTRO analytical lab. Ltd., Okhla, New Delhi) for analysis of the total lead content of dry weight of the paint. The paint samples were analyzed using the CPSC-CH-E1003-09 (Inductively Coupled Plasma (ICP) spectroscopy method, as recognized by both the WHO and the United States Consumer Product Safety Commission as appropriate for the purpose.



Results and Discussion

90%
of the analyzed paint
samples had lead
levels above 90 ppm.

3.1 Results

In the present study 32 samples were analyzed for total lead content. The detailed results are presented in the table below (Table 1)

- **90%** of the analyzed paint samples had lead levels above 90 ppm.
- The lead content was observed between **10 ppm to 186062ppm** which is above the prescribed standard of 90 ppm as per the regulation.
- The lowest lead content (10 ppm) was observed in a Golden Yellow colored sample collected from Bangalore, Karnataka. This sample can was labeled as "less than 90 ppm of lead".
- The highest lead concentration of **186062 ppm** was observed in a golden yellow colored paint collected from Tamil Nadu.
- The Lead content was found to be 4306 PPM in the samples collected from the online portal Amazon.



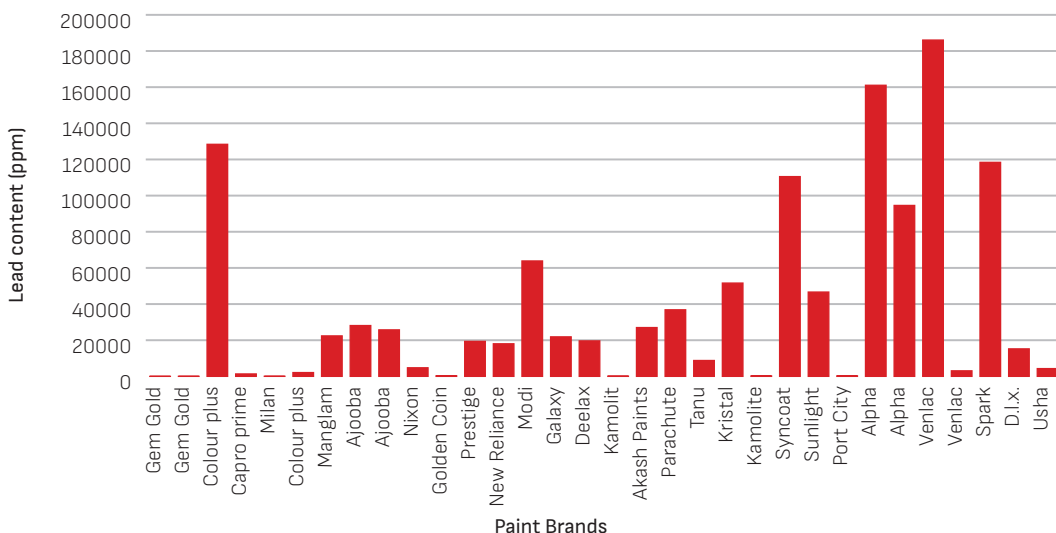
Table 1 Lead concentration in different paint samples

Sample No.	Brand name	Manufactured by:	Mfg Date:	Sampling location	Color	Labeling	Lead content (ppm)
TL-1	Gem Gold Premium Enamel	Gem Paints Private Limited, #417/418, 11 Cross, 4 Phase Peenya Industrial Area, Bengaluru, Karnataka 560058	Aug, 2019	Bangalore	Golden Yellow	Lead contents less than 90 ppm	10
TL-2	Gem Gold Premium Enamel	Gem Paints Private Limited, #417/418, 11 Cross, 4 Phase Peenya Industrial Area, Bengaluru, Karnataka 560058	Jan, 2019	Bangalore	PO Red	Lead contents less than 90 ppm	36
TL-3	Colour plus	Creative Paints, 407/4, Khatipurs, Sukhliyagram, Link Road, Indore (MP)	Not mentioned	Bhopal	Gol. Yellow	Not mentioned	128388
TL-4	Capro prime	Capri paints 109, Sector- I, Indl Area, Govindpuri, Bhopal	July, 2019	Bhopal	Golden yellow	Not mentioned	1358
TL-5	Milan	Pacific Paints Industries Plot No. 1914, Phase iv, GIDC Estate, VitthalUdyog agar-388121. Anand, Gujarat	Jan. 2017	Bhopal	BR White	Not mentioned	52
TL- 6	Colour plus	Creative paints,9/3, TulsyanBalaji Industrial Estate, Indore	Not mentioned	Bhopal	Wild Lily	Not mentioned	2112
TL- 7	Manglam	Popular Paints & Chemicals, Amanaka, Raipur	Not mentioned	Chattisgarh	P O Red	Not mentioned	22395
TL- 8	Ajooba	Zar Metamorphose Combine Gram: Dunda- 492015	Sep-19	Chattisgarh	P O Red	Not mentioned	28120
TL- 9	Ajooba	Zar Metamorphose Combine Gram: Dunda- 492015	Jun-18	Chattisgarh	P O Red	Not mentioned	25734
TL- 10	Nixon	Universal Coating, 8/3/1-A, Jawahar Nagar, Loni Road, Delhi-94	Dec-18	Jharkhand	Black	Not mentioned	4757

TL- 11	Golden Coin	Silver Bawa Coatings, Plot 1,Lane 14, Samaypur, Delhi-42	Oct-18	Jharkhand	Gold	Not mentioned	292
TL-12	Prestige	Prestige color company Adm off. 514, Fifth floor, Anand Building, 82/84, KaziSayed street, Maszid west, Mumbai- 400003	Oct-16	Jharkhand	Bus Green	Not mentioned	19368
TL-13	New Reliance	Navjyoti Paints Industries,61/18, Block A AnandpurDham, Village Karala Delhi-110081	May-19	Rajasthan	PO Red	Not mentioned	18028
TL-14	Modi	Modilmpex Panchawala Jaipur	Jun-19	Rajasthan	G. Yellow	Not mentioned	63852
TL-15	Galaxy	Venus Paints, F-804, Road No, 13-N, VKI Area, Jaipur	Oct. 2018	Rajasthan	Bus Green	Not mentioned	21868
TL-16	Deelax	Prem Paints Industries	Aug-18	Rajasthan	Bus Green	Not mentioned	19624
TL-17	Kamolite	Kamdhenу Limited, E-538 and 539 A, RIICO industrial area, Chopanki-301707, Dist. Alwar	Jan-19	Rajasthan	Golden Yellow	Lead content does not exceed 90 ppm	130
TL-18	Akash Paints	Shubh Paints and chemicals	Not mentioned	Rajasthan	Bus Green	Not mentioned	27011
TL-19	Parachute	Venus Paints, F-804, Road No, 13-N, VKI Area, Jaipur	Sep-19	Rajasthan	PO red	Not mentioned	36829
TL-20	Tanu	Royal Paint and Chemicals Jaipur	Sep-17	Rajasthan	Bus Green	Not mentioned	8787
TL-21	Kristal	Nandani Paints Pvt ltd	July, 2016	Rajasthan	Golden Yellow	Not mentioned	51619
TL-22	Kamolite	Kamdhenу Limited, E-538 and 539 A, RIICO industrial area, Chopanki-301707, Dist. Alwar	Jan-19	Rajasthan	Mint green	Lead content does not exceed 90 ppm	240
TL-23	Syncoat	EESDEE paints Ltd 203, Navketan, CA Road, Chembur, Mumbai	Not mentioned	Uttar Pradesh-Meerut	Golden Yellow	Not mentioned	110523

TL-24	Sunlight	United Paints and Chemicals Industries, Plot No. 120/121, Industrial Estate, Sangli 416416	Jul-19	Goa	Mint green	Not mentioned	46650
TL-25	Port City	Agsar Paints (P) Ltd, 509, George Road, Tutricorn	Jan, 2019	Goa	Golden Yellow	Lead content does not exceed 90 ppm	270
TL-26	Alpha Synthetic Enamel	Sri Senthil paints, 86, Sidcolnustrial Estate, Vichoor, Manali, new town, Chennai	Jul-19	Tamil Nadu	Auto Golden Yellow	Not mentioned	161052
TL-27	Alpha Synthetic Enamel	Sri Senthil paints, 86, Sidcolnustrial Estate, Vichoor, Manali, new town, Chennai	Aug, 2018	Tamil Nadu	Auto Red	Not mentioned	94571
TL-28	Venlac Super synthetic enamel	Pee veekay Industries SF 159/5A-5B, Meikalnaickenpatty, Thalamalaipatty (PO), ThotiyamTuluk, Trichy District, Pin-621215	Sep-18	Tamil Nadu	Golden Yellow	Not mentioned	186062
TL-29	Venlac Super synthetic enamel	Pee veekay Industries SF 159/5A-5B, Meikalnaickenpatty, Thalamalaipatty (PO), ThotiyamTuluk, Trichy District, Pin-621215	Jan-19	Tamil Nadu	P.O. Red	Not mentioned	3069
TL-30	Spark	Kumar Paints (India) Pvt. Ltd., S-10, B.S. Road, Industrial Area, Site No. 1, Ghaziabad (U.P.)	Nov-18	Delhi	G. Yellow	Not mentioned	118417
TL-31	D.I.x.	Shivam Industries, Khasra No. 87/23 Village Barwala, Delhi-110039	Feb, 2017	Delhi	P.O. Red	Not mentioned	15219
TL-32	Usha super synthetic enamel	Usha Paints, C-20-1, Sardar Estate, Ajwa Road, Vadodara-19	Dec, 2019	Delhi- Purchased from Amazon	P.O. Red	Not mentioned	4306

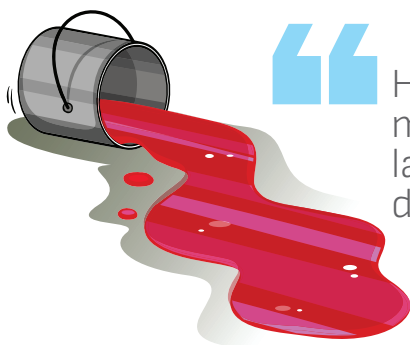
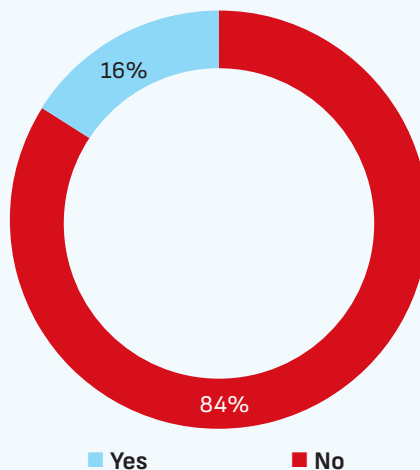
Figure 2 Lead levels in paint samples



3.2 Labeling on the Paint Cans

As per the Regulations of Lead content in Household and Decorative Paints, 2016, *"Household and Decorative Paints manufactured or imported shall be labeled stating that the lead content does not exceed 90 parts per million"*. Yet, the Toxics Link study has indicated that most of the brands viz. **84% of the manufacturers** did not have any label indicating the lead level content in their paint. This is indicative of a serious gap as these unlabeled products are being put on the shelves in the market providing no choice to the consumer to choose a safer product.

Figure 3 Labeling of lead content



Household and Decorative Paints manufactured or imported shall be labeled stating that the lead content does not exceed 90 parts per million

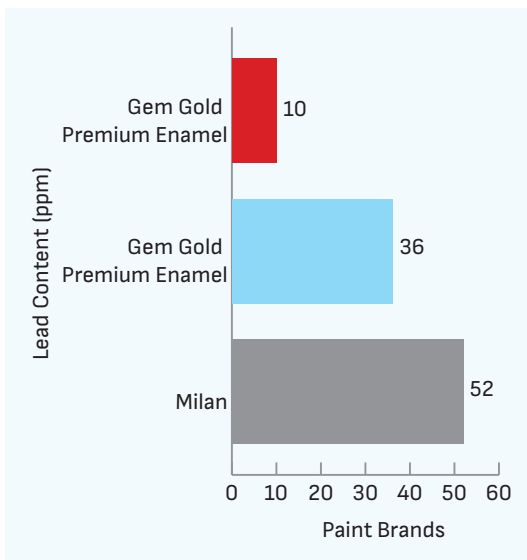
3.3 Paint samples having less than 90 ppm

The study revealed that out of 32 samples from across the country, only three paint samples had lead levels below 90 ppm. Though one sample from Bhopal, was not labeled the test results have found low lead content in it.

Table 2 Lead content less than 90 ppm

Brand name	Location	Labeling	Lead content (ppm)
Gem Gold Premium Enamel	Bangalore	Lead contents less than 90 ppm	10
Gem Gold Premium Enamel	Bangalore	Lead contents less than 90 ppm	36
Milan	Bhopal	Not mentioned	52

Figure 4 Lead content less than 90 ppm



3.4 Results of the paint samples manufactured after November 2017

The manufacture of paints containing Lead has been prohibited after the implementation of the rules since November 2017. It is to be noted that in this study most of the samples that were tested viz. **69%** were manufactured after November, 2017. The remaining 15% of the samples were manufactured before Nov. 2017 while the other 15% did not contain any label about their manufacturing date.

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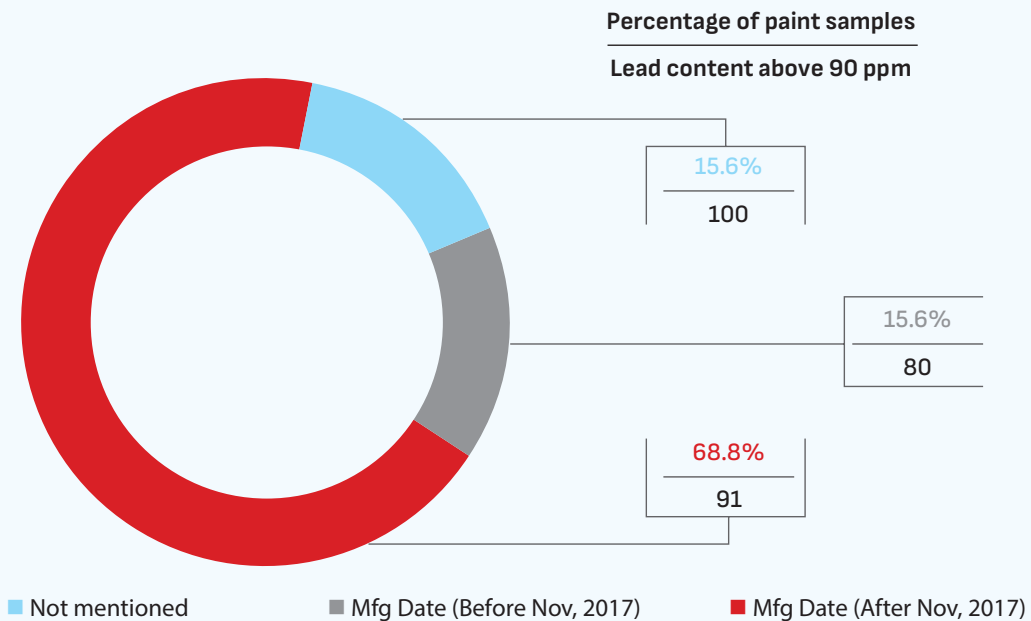
of the samples were manufactured before Nov. 2017 while the other

15%

did not contain any label about their manufacturing date



Figure 5 Manufacturing dates of samples



The study indicates that 91% of the paint samples manufactured after Nov. 2017 had lead content of more than 90 ppm.

The rules also prohibited the sale of Lead paints manufactured after November 2018

(i.e. two years after the notification of the rules). Yet the results showed that quite a large number of paint samples having lead content of more than 90 ppm are still available in the market.

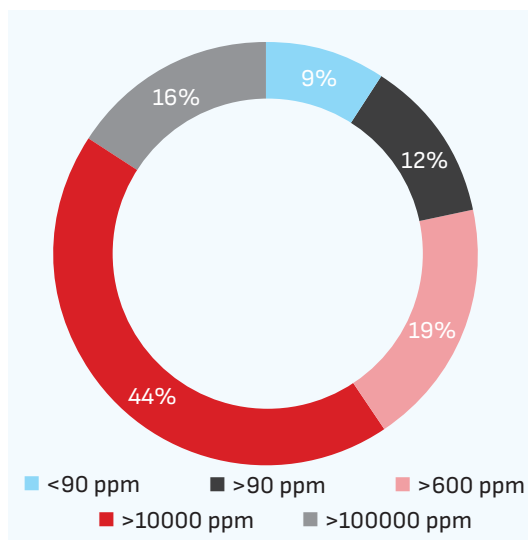
91%
of the paint samples
manufactured after Nov. 2017
had lead content of more than
90 ppm

3.5 Varies Lead Level in Paints

The research study detected varied Lead levels in the paints ranging from 10 PPM to 1, 86, 000 PPM. The regulation has set the limit of 90 ppm i.e. if the concentration exceeds this level, it is not considered safe for use. However, as per our study only 9% (3 samples) had less than 90ppm of lead content. The remaining **91%** had either slight or exceptionally high lead content.

The results show that most of the samples, viz. **44%** had lead content between 10000– 100000 ppm and **16%** had exceptionally high levels i.e. more than 100,000 ppm.

Figure 6 Varied concentrations of lead



A large number of paint samples having lead content of more than

90 ppm

are still available in the market

Conclusion

The research study has reflected the poor implementation of the rules on the use of Lead in paints in the country even after the rules came into effect from November 2017. The overall scenario across the country is more or less similar as the samples have been collected from nine states; Chhattisgarh, Delhi, Goa, Jharkhand, Karnataka, Madhya Pradesh, Rajasthan, Tamil Nadu and Uttar Pradesh. Furthermore the presence of unlabeled products in the market raises question on how these products are being approved and the mechanism for independent assessment of the overall market scenario on the availability of lead-safe paints. Another important finding of the study is the lack of a system in place for the certification for lead-safe paints. Moreover those paint manufacturers who are violating the safety standards need to be prosecuted and penalized under the EPA Act.

Over the years, Toxics Link's studies have found that there are still bottlenecks in Small and Mediums Scale Enterprises (SMEs) in adhering to the regulation of 90 PPM. Perhaps there is also a need for handholding through technical or financial resources to the SMEs to shift to lead-free paints.

Lead is a well-known health hazard and efforts are being made to reduce the impact of lead on

the environment. Therefore the issue needs to be taken up as a priority considering the serious impacts it can cause to both human health and environment and a stricter monitoring regime needs to be put in place by the concerned authorities to completely eradicate the metal from household paints

Some of the major gaps in implementation identified in this study are:

- Paints containing high levels of lead which have been manufactured in the year 2017, 2018 and 2019 are widely available across the country in clear violation of the rules.
- The study has reflected the bottlenecks in small and medium scale enterprises in not adhering to the 90 PPM lead standard as per the rules.
- The study has also shown that the SMEs in India have the ability to adhere to the standard of Lead in paints.
- One of the paint samples was found to have about **2000** times higher lead levels than the Indian lead in paint standard i.e. 90 ppm.
- Concerns have been raised through the study on the existing monitoring or compliance mechanism to check for labeling and lead content in paints across the country.





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