

# The Need for Regulating Lead Paint

Toolkit for establishing  
laws to eliminate  
lead paint

Second Edition

Module A-1



Global Alliance to  
Eliminate Lead Paint

# Outline

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- Background
- What is Paint?
- Why Lead Paint is a Problem?
- Justification for Setting a 90 ppm Limit
- Summary
- References
- Point of contact



# Background

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- Lead is a **versatile** and **widely used toxic substance**.
- Compounds of lead are **added to paint to obtain specific characteristics**, e.g. colour, rapid drying, corrosion resistance.
- Paint with lead is **used for decoration of interior and exterior surfaces** in homes and public buildings, on roads and bridges, and also on toys, furniture and playground equipment.
- This presentation will explain why lead paint **is of concern**, and why it **needs to be regulated**.

# What is Paint, and How Can It Be Described?

- By its solvent base:
  - **water**-based paint - commonly called latex or acrylic paint
  - **organic** solvent-based paint - commonly called alkyd paint
- By its intended use, e.g.:
  - **decorative paint** - commonly used for aesthetic or architectural purposes
  - **industrial paint** - commonly used for corrosion protection or for reflecting road safety marks and traffic signages, etc.
- By its final appearance, e.g.:
  - **enamel paint** - hard, glossy and opaque finish

# Lead Compounds Have a Range of Functions in Paint

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Lead can be added to paint in the form of **pigments, driers** and **anti-corrosive agents**, resulting in extremely high lead content.

**Pigments** - The most commonly used lead pigments are lead chromates and lead molybdates which are bright yellow, orange or red in colour.

- Lead carbonates and lead sulfates can be used as white pigments, but are rarely used since lead-free alternatives perform better.
- These pigments can also be used in a mixture with other pigments to produce bright colours such as green and purple.

**Alternative, non-lead compounds** exist for all the functions of lead in paint and result in paint of equivalent quality.

*See Module D-3 for more information on alternatives to lead in paint*

# Contribution of Components to the Lead Content of Paint

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- **Concentration** is expressed in terms of the proportion of lead to the weight of the total non-volatile part of the product, or of the weight of the dried paint film.
- A **range of units** may be used e.g. ppm, %,  $\mu\text{g/g}$ , mg/kg
  - $10 \text{ ppm} = 0.001\% = 10 \mu\text{g/g} = 10 \text{ mg/kg}$
- **Lead-based pigments may contribute around 1500 to >100 000 ppm**, depending on whether they are mixed with other pigments or used alone.
  - Red and yellow paints may have particularly high lead content.
- **Lead-based driers may contribute around 1200 to 6000 ppm or more**, depending on whether they are mixed with other driers.
- Where there is **unintended contamination**, this typically contributes  **$\leq 90$  ppm**.

# Why is Lead Paint a Problem?

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## Persistence in the environment

- **Lead paint is a source of lead exposure** during its manufacture, application and removal.
- **Lead paint breaks down over time**, fragmenting into flakes and dust that can contaminate the domestic environment.
- **Lead is persistent in the environment**, and when released can remain there indefinitely.
- **Lead paint can leave a legacy of potential human exposure** for many years into the future – **children are particularly vulnerable**.

# Why is Lead Paint a Problem? (Continued)

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## Types of exposure

- **Lead paint** that is peeling, chipping, chalking or cracked is a health hazard, however, intact lead paint in good condition is usually not a hazard.
- **Lead dust** is created when lead paint is scraped, dry sanded, heated or burned, or when painted surfaces rub together. Lead chips and dust can settle on surfaces and objects that people touch. Settled lead dust can re-enter the air when people vacuum, sweep, or walk through it. Dust from lead paint can contaminate soil.
- **Lead in soil** can be a source of exposure when children play on the ground, or when people bring soil into the house on their shoes. Plants can absorb lead from the soil and lead can enter the food chain. Lead present in soil may also migrate into underground water in certain circumstances.



# Why is Lead Paint a Problem? (Continued)

## Health impacts

- **Lead is a multi-system toxicant affecting many systems of the body.**
- **Children can be highly exposed** because they spend time on the ground and in contact with contaminated soil and dust, they frequently put their hands to their mouths and absorb more lead from the gut than adults.
- **Childhood lead exposure can damage the brain and nervous system** resulting in decreased IQ, behavioural problems and reduced educational level – these may be irreversible.
- **Lead also causes a significant burden of disease** through other long-term impacts on health, such as: reduced IQ, antisocial behaviour, cardiovascular & renal disease.

*See Modules B-1 and B-2 for more information on the health and environmental impacts of lead*

# Why a 90 ppm Limit on Lead Content?

- **Lead is harmful at all levels of exposure**, so there is no safe level of lead exposure.
- **There is no therapy that can reverse the effects of lead** on brain development and the cardiovascular system.
- It is essential to **limit exposure to lead as much as possible**.
- **A limit of 90 ppm is the lowest maximum level** currently required by any country.

# A 90 ppm Limit on Lead Content is Technically Feasible

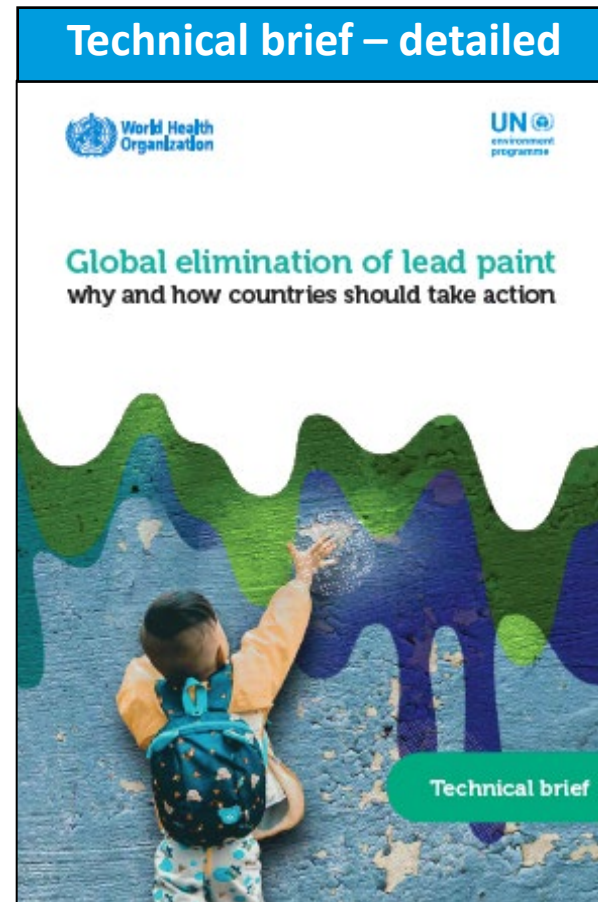
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- **Non-lead-based pigments, dryers and anti-corrosives are widely available** for oil-based paints, and are used by many manufacturers to produce high quality paints
- **Paint made with compounds that are not lead-based** will have a lead content <90 ppm
- **If care is taken to source uncontaminated raw material ingredients** the lead content can be much lower than 90 ppm

# A 90 ppm Limit on Lead Content Promotes Trade

- **90 ppm is becoming an accepted international standard** around the world for lead levels in paints
- **As awareness about danger of lead paint grows** there will be an increasing demand for safer paint
- **Already used in a number of countries**, e.g. Canada, Cameroon, China, Ethiopia, India, Kenya, Nepal, the Philippines, the United Republic of Tanzania, and the United States of America

# Additional Information Available on WHO Website



<https://apps.who.int/iris/handle/10665/333840>



<https://apps.who.int/iris/handle/10665/333812>

# Summary

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- Lead paint can contain a range of lead compounds for different purposes
- Lead paint can cause a long-lasting hazard to health in all age groups, however, **children are especially vulnerable**
  - **There is no known safe level of exposure to lead**
- Paints with the required properties can be made without adding lead
- As more countries regulate lead paint the market for such paints will continue to shrink
- **Stopping the addition of lead to paint makes public health and business sense**

# References

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1. Global elimination of lead paint: why and how countries should take action: technical brief (2020) World Health Organization  
<https://apps.who.int/iris/handle/10665/333840>
2. Global elimination of lead paint: why and how countries should take action: policy brief (2020) World Health Organization  
<https://apps.who.int/iris/handle/10665/333812>

# Disclaimer

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Please contact the Chemicals and Health Branch of the United Nations Environment Programme and the Chemical Safety and Health team of the World Health Organization should you have any questions.

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