

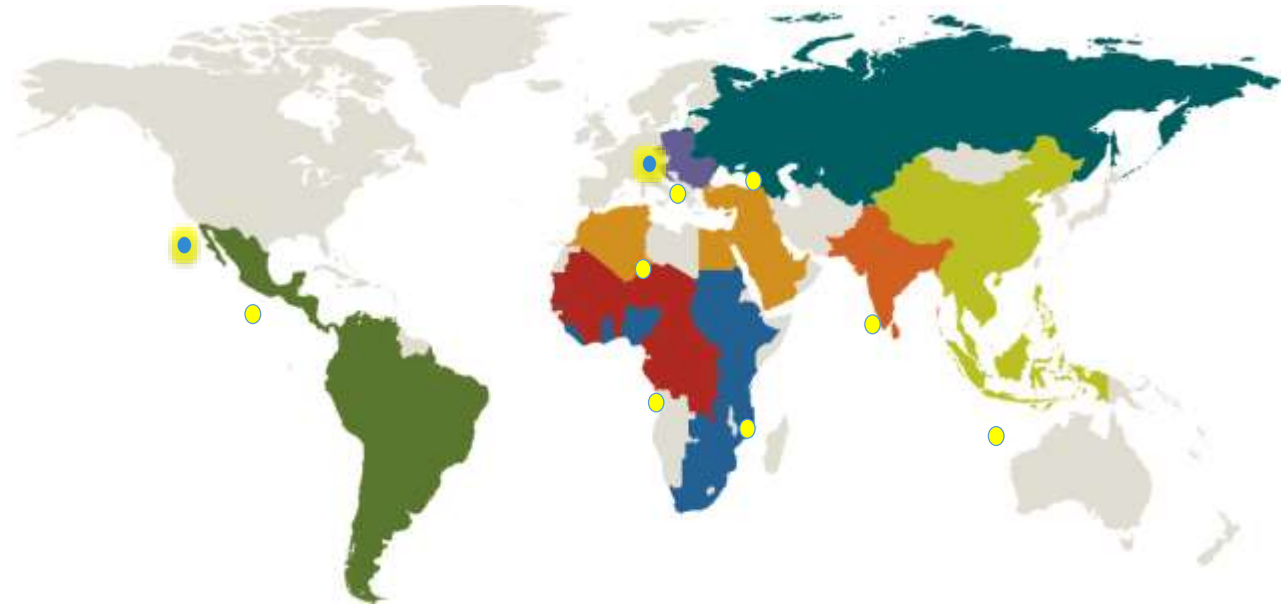
- Studies of Lead in Paint
- Alternatives to Lead in Paint
- Voluntary Actions by Paint Manufacturers



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# A Global NGO Network



**700 NGOs in more than 100 Countries working on:**

- ✓ POPs
- ✓ Toxic Metals: Lead and Mercury
- ✓ Safe Chemicals Management (SAICM)



## Mission

# A TOXICS FREE FUTURE FOR EVERYONE

A world in which chemicals are no longer produced or used in ways that harm human health and the environment



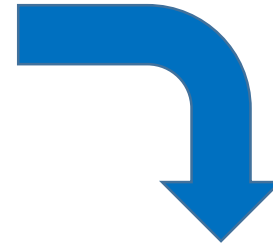


a toxics-free future

# Model

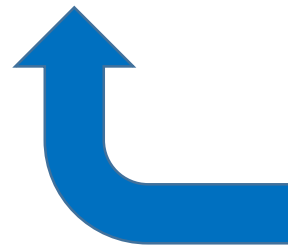
## Globalizing Local Priorities

Identifying national issues of concern and linking local constituencies to the global process



## Localizing Global Policies

Securing and leveraging global policies and resources for on-the-ground change



## IPEN's Global Lead Paint Elimination Campaign

- Launched in 2009 in reaction to high lead levels in paint found in India
- Active in all UN Regions
- Organized studies of lead in paint in over 40 countries to date

**No legally binding limits on lead paint  
⇒ paint with high levels of lead on the market**



# African Lead Paint Elimination Project (2014- 2017)

- Funded by the Global Environment Facility;  
Implemented by UNEP; Executed by IPEN
- 4 Focus Countries: Cameroon, Cote D'Ivoire,  
Ethiopia, Tanzania
- Paint studies in additional 8 African countries (data  
to be released in 2016!)
- Project activities include
  - Sampling and analyzing paint
  - Outreach to paint manufacturers to encourage  
voluntary action
  - Promoting legal Instruments  
to control lead in paints



# Recalling the Toolkits usefulness

<http://web.unep.org/chemicalsandwaste/noleadinpaint/toolkit>

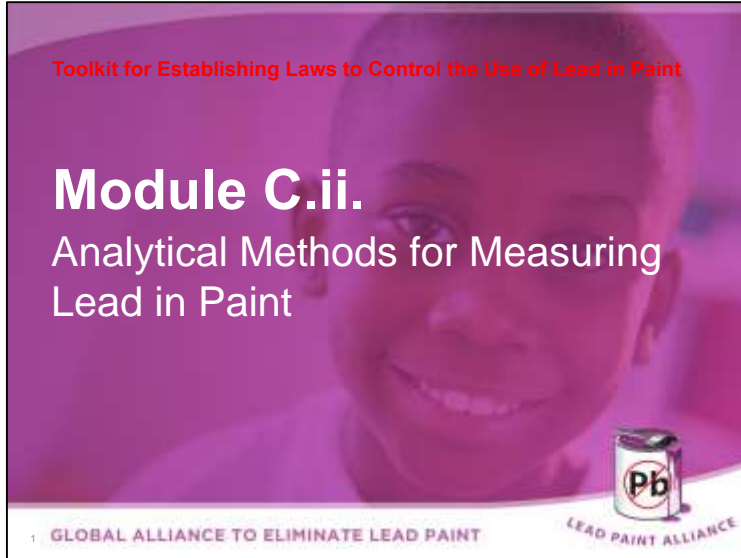
To achieve the overall goal of the workshop  
*“...to advance understanding, commitment,  
and actions towards the development of  
national and regional regulations and  
standards on a **total lead content limit  
of 90 ppm for all paints in East Africa**”*

# Toolkit Modules

Toolkit for Establishing Laws to Control the Use of Lead in Paint

## Module C.ii.

Analytical Methods for Measuring Lead in Paint



GLOBAL ALLIANCE TO ELIMINATE LEAD PAINT

LEAD PAINT ALLIANCE

## Module E

Alternatives to lead in paint



GLOBAL ALLIANCE TO ELIMINATE LEAD PAINT

LEAD PAINT ALLIANCE

## Module G

Challenges for Small and Medium Sized (SME) Paint Manufacturers



GLOBAL ALLIANCE TO ELIMINATE LEAD PAINT

LEAD PAINT ALLIANCE

+ Some additional information not in the toolkit, but useful for the goals of this workshop



## All Paint

The term “paint” includes: varnishes, lacquers, stains, enamels, glazes, primers or coatings used for any purposes

- Consumer Paint
  - E.g. Decorative paint; home use anti-corrosives; primers, etc.
- Non-consumer Paint
  - E.g. Steel structures; Boat hull paint; industry machinery,

**Non-consumer paint may still be a hazard since**  
**- workers (and their families) get exposed during production**  
**- it often end up in regular stores**

## Reasons for Analyzing Lead Content of Paint

- Assess the availability of lead-containing paint in the market and the need for better government regulation and enforcement
- Provide consumers with information so they can choose non-lead paint and can push for government controls on lead paint
- Draw attention to companies that produce lead-containing paint and encourage them to voluntarily reformulate their products



## Measuring Lead content of paint

- Leaded ingredients are primarily used in solvent-based paint, however, high levels of lead have been detected in water-based paint in a few cases
- Important to use internationally recognized standardized methods
- NOTE: Standardized methods do not specify any legal levels, only the analytical method
- Lead paint formulations and regulatory standards for lead in new paint are usually expressed as a percentage (%) or as parts per million (ppm) of lead in dry paint

100 ppm = 0.01% = 100  $\mu\text{g/g}$  = 100 mg/kg

## Important lab considerations

- Lab selection crucial to ensure accuracy and reliability of results
- Trained personnel and good quality assurance procedures are essential
- Laboratory should participate in a proficiency-testing scheme, e.g. the Environmental Lead Proficiency Analytical Testing (ELPAT) program
- A range of suitable internationally recognized standardized methods (ISO, ASTM, etc) exists to measure total lead content
- By allowing for the whole range of standardized methods to be used in national standards, lab options increase

## International standards for analyzing lead in paint

### Sample preparation

- **ISO 1513**, Paints and varnishes - Examination and preparation of test samples
- **ASTM E1645-01**, Practice for Preparation of Dried Paint Samples by Hotplate or Microwave Digestion for Subsequent Lead Analysis
- **ASTM E1979-12**, Practice for Ultrasonic Extraction of Paint, Dust, Soil, and Air Samples for Subsequent Determination of Lead

### Analytical methods

- **ISO 6503**, Paints and varnishes - Determination of total lead - flame atomic absorption spectrometric method. (For measurement of lead concentration of 0.01% to 2.0%)
- **ASTM D3335-85a(2014)**, Standard test method for low concentrations of lead, cadmium, and cobalt in paint by atomic absorption spectroscopy. (For measurement of lead concentration of 0.01% to 5.0%)
- **ASTM E1613-12**, Standard Test Method for Determination of Lead by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES), Flame Atomic Absorption Spectrometry (FAAS), or Graphite Furnace Atomic Absorption Spectrometry (GFAAS) Techniques (Measurement of lead concentration differs per analytical technique)

## Data from Participating Countries

Country	Study Year	Number of Paints	% Above 90 ppm (Total)	% Above 10,000 ppm (Total)
Tanzania	2015	56	64%	23%
Ethiopia	2015	36	78%	47%
Kenya	2012	31	77%	29%

Paint study underway in Uganda, results will be released later in 2016

## Data from Other African Countries

Country	Study Year	Number of Paints	% Above 90 ppm (Total)	% Above 10,000 ppm (Total)
Cameroon	2015	54	50%	17%
Cote d'Ivoire	2015	20	72%	32%
Egypt	2009	20	65%	
Ghana	2013	18	33%	17%
Nigeria	2009	23	100%	
Senegal	2009	21	86%	
Seychelles	2009	28	68%	
South Africa	2009	29	38%	
Tunisia	2013	30	21%	27%

## Why a Total Lead Content Limit is Recommended

- Measured by extracting all lead present in the paint
- Almost all national regulatory standards use total lead content
- Promotes harmonization for exports to countries with total lead standards for products
- Cheap, routine lab methods are available and many labs can do the measurements
- Provides a more predictable test for manufacturers based on lead content of added ingredients



What is the difference between measuring total lead content in a paint and measuring soluble lead content?

Note: Soluble lead content also called Migration of Lead

## Why a Soluble Lead Content Limit is Not Recommended

- Supposed to simulate uptake of lead from gut when paint chips or coated objects being swallowed

### NOTE

- No scientific basis support this assumption.
- Doesn't take main exposure rout of dust into account and does not provide the best measure of potential health risks
- More expensive for manufacturer and enforcement agency since the lab method is more complicated and few labs can do the analysis
- Complicated, expensive method increase likelihood for non-compliance
- Technical modifications to paint can hide dangerous lead content  
(paint shown to have 13,000 ppm total lead content not detected by soluble lead method)

## Important Reminders about Exposure

- Exposure = the blood lead levels, not the amount of lead in the paint
- Exact blood lead level impossible to predict from lead in the paint
- Scientifically well established link between lead paint and blood lead levels
  - Lead in worn and chipping paint released to household dust
  - Household dust ingested by children
  - Ingested lead-contaminated dust release lead into the bloodstream
- This is a general route, not country specific

# Alternatives to Lead in Paint

## 90 ppm total lead limit

- Achievable
  - ⇒ levels as low as 10 ppm and lower is in many cases achieved when care is taken with raw materials and production procedures
- 90 ppm is currently the most protective legal limit enacted: e.g. US, Philippines, Nepal,
- 90 ppm drafted legal limit in India, Cameroon
- The lower the legal limit, the more protective. However, a 0 ppm legal limit is not a feasible standard

# Alternatives to Lead in Paint

## Replacing Leaded Ingredients

- Two leaded paint components: driers and pigments
- Consumer Paint
  - Cost-effective, high quality alternatives have been used for decades and are widely available
- Non-consumer Paint
  - Typically used for special qualities such as heat resistance
  - High quality alternatives are around but substitution can sometimes be more complicated
- No 1:1 substitutes
- Key is to find a supplier who can provide the right materials in the right quantities for the right price
- Technology for reformulation

# Alternatives to Lead in Paint

## Replacing Lead Driers

- Easily substituted by just changing the leaded ingredients for one other compound
- Optimization process includes finding right substitute ratio
- Strontium driers best substitute
  - Non-toxic
  - 1/3 of strontium drier needed compared to lead driers
- Other non-lead alternatives available, but many still toxic e.g. zirconium compounds
- <http://ipen.org/documents/lead-drier-replacement-solvent-based-alkyd-decorative-paints>

## Replacing lead pigments

- **White lead** easily replaceable with titanium dioxide (both cheaper and produce a higher quality paint!)
- Alternatives to **red lead** anticorrosive pigment widely available
- Lead sulphochromate (PY34) and lead chromate molybdate sulphate (PR104)
  - Lead pigments that produce bright colors (yellow, red, green, orange, etc.)
  - Replacement typically require more research
  - Best substituted by a combination of different organic and inorganic pigments to give the desired color and properties
- <http://ipen.org/documents/replacement-lead-pigments-solvent-based-decorative-paints>

# Voluntary Action by Paint Manufacturers

## Most manufacturers support lead paint elimination

- Lead paint production due to
  - unawareness
  - Lack of knowledge about hazards of lead in paint
  - Lack of access to know-how about paint reformulation
  - Lack of knowledge of consequences of changing production
- Enforced legally binding restrictions necessary to level the playing field
- Large manufacturers have in-house labs and access to suppliers ⇒ rapid reformulation
- Smaller manufacturers may need more time and/or technical support



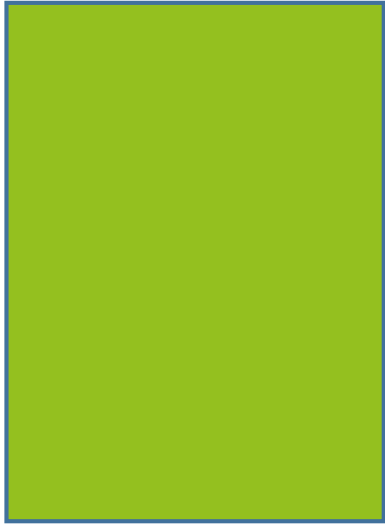
# Voluntary Action by Paint Manufacturers

## Eliminating lead from paint good for business

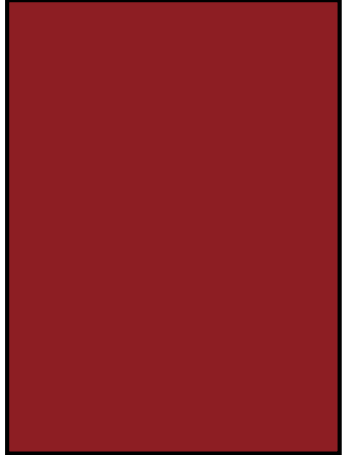
- Lead Safe Paint certifies that all paints under a brand contain lead levels below 90 ppm
- Complements national regulations, ⇒ not a replacement for legal limits
- Developed by a multi-stakeholder group lead by the **Philippine Association for Paint Manufacturers**, initiated by the EU-funded IPEN Asian Lead Paint Elimination Project
- Managed by SCS Global Services, an independent international third-party certification company

<https://www.scsglobalservices.com/>





**THANK YOU!**



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