

中国含铅涂料监管及标准

Supervision and Standard of Lead Paint in China

曾昆

工信部赛迪研究院

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Zeng kun

China Center for Information Industry Development(CCID)

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01 监管必要性

I. Necessity of Supervision of Lead Paint in China

1. 铅的危害

A. Harm of lead

铅是一种有毒重金属，铅广泛生产和使用带来了严重的环境污染和健康问题。

Lead is a toxic heavy metal. Its widespread production and use have caused serious effects on environmental safety and human health, such as toxic effects to the developing brain, nervous system, kidneys and reproductive system.



图片来源：世界卫生组织



- 铅可以在骨骼中累积好多年

Lead can be bio-accumulated in animals and human bones for many years

- 影响人体所有系统

Lead can affect human body systems and organs

- 没有最小安全值

There is no minimum standards of lead for human safety.

- 铅对胎儿和幼儿的危害尤其严重，含铅涂料是儿童接触铅的最大来源之一，每年造成约600万儿童智力残疾

Lead has a severe effect on the embryo and infant. Lead paint is one of the largest sources of lead exposure to children globally causing 600,000 new cases of intellectual disability among children every year

- 铅的危害是永久性的

Lead has a permanent harmful effect

2. 含铅涂料

B. Lead paint

- 含铅涂料：铅化合物被添加在涂料中



Lead paint: lead compound is added to the paint

- ✓ 颜料、干燥剂(pigment、 desiccant)

- 含铅涂料用途

the application of lead paint

- ✓ 用于建筑物装饰、玩具、家具、游乐设施、道路、桥梁、其他建筑物
building decoration、 toy、 furniture、 recreational facilities、 bridges
and so on

- 含铅涂料的危害

the harm of lead paint

- ✓ 在生产、应用和去除过程中铅释放到环境中

lead can be released to the environment in the process of production、
application and removing

- 超过使用期的含铅涂料涂层表面会脱落、磨损或毁坏，继续污染家居环境
lead paint out of expiration period will come off, wear off or be destroyed, but it will continue to contaminate the living environment
- 铅可以在环境中无限期地累积存在
lead can be accumulated in the environment permanently
- 含铅涂料可导致长期的人体接触
lead paint can be touched by human for years





3. 含铅涂料的危害受到全球重视

B. The harm of lead paint an issue of international concern

- 2009年5月，国际化学品管理大会第二次会议(ICCM2)通过了II /4 B决议，建立一项全球伙伴关系，以推动逐步淘汰含铅涂料中铅的使用；

In May 2009, the emerging environmental and health concern on lead in paint was identified through resolution II/4 B by the second International Conference on Chemicals Management (ICCM2) in May 2009 as one of the four global emerging policy issues ;

- 2012年，第三届国际化学品管理大会(ICCM3)支持全球环境基金(GEF)的化学物质策略，支持消除含铅涂料；

In 2012, the third session of the International Conference on Chemicals Management (ICCM3) welcomed the support of the Global Environment Facility's (GEF) Chemicals Strategy in eliminating lead paint



- 世界卫生组织和联合国环境规划署建立的消除含铅涂料全球联盟（GAELP）致力于在全球范围内淘汰含铅涂料；

World Health Organization(WHO) and United Nations Environment Programme(UNEP) established the Global Alliance for Elimination of lead paint (GAELP), committed to the worldwide elimination of lead paint ;

- 2015年，国际化学品管理大会第四次会议(ICCM4)指出，鼓励各国政府、民间组织和私人部门参与全球消除含铅涂料联盟的工作，协助实现其提出的2020全球淘汰含铅涂料的目标。

In 2015, Fourth Meeting of the International Conference on Chemicals Management (ICCM4) pointed out that governments, civil society organizations and the private sector are encouraged to participate in the work of GAELP to achieve the global goal of phase-out of lead paint in 2020.



4. 中国含铅涂料使用现状

D. Application status of lead paint in China

- 中国是销售含铅涂料的40个国家之一，2014年中国含铅涂料产量约为50万吨

China is one of 40 countries selling lead paint. In 2014, China produced about 500,000 tons of lead paint

- 铅作为添加剂广泛用于涂料中，含铅涂料对环境与健康造成了较大的伤害

As a additive, lead can be widely added to the paint. Therefore, lead paint has a harmful effect on environment and health

- 为消除含铅涂料的危害，中国已采取多项整治措施，如在生活领域涂料使用上制定了强制性铅含量标准

To eliminate the hazard of lead paint, China has taken a lot of remediation measures, such as formulating mandatory standards of lead content contained in life



- 目前在工业领域还没有相应的法规和标准，工业领域含铅涂料用量非常大；
There is no mandatory standards of lead content regulations and standards in the industrial field, which consumes a lot of lead paint;
 - ✓ 船舶涂料、集装箱涂料、重防腐涂料和马路标线漆中的防腐颜料和铅铬颜料是中国铅污染的重灾区，2013年以上领域的涂料生产量约为200万吨（不包括已有标准的建筑钢结构涂料）；
 - ✓ Excessive lead problems are existed in anti-corrosion and lead-chromium painting in ship coating, container coating, heavy corrosion coating and road marking paint. According to statistic data in 2013, these areas almost produced 2,000,000 ton coatings(without steel structure for construction which have lead content standards already) ;

✓ 中国产集装箱占全球市场份额的95%；

Containers made in China accounted for 95% of global market share;

✓ 工程机械、彩钢、及其它工业产品（铁路机车）所用涂料也存在含铅的现象，且出口量较大，以上领域的含铅涂料均存在向世界其它国家扩散的风险；

Coatings used on engineering machinery, steel, and other industrial products (locomotive) also have lead, and export volumes of these products are quite large. Through the export there is the risk of lead spread to other countries in the world.





- ✓ 含铅涂料用于公路桥梁中，桥梁改造工程中除漆已被列为工人接触铅的主要来源；

Lead paint has been used in highway and bridge for many years ,the paint removal during bridge reconstruction project has been identified as a major source of worker exposure to lead;

- ✓ 住宅改造涉及涂料去除，干喷砂、喷砂、燃烧、焊接、或加热含有含铅涂料的涂层表面后，铅扩散到空气中。

Residential renovation must remove coating which contains lead paint and the process of dry sand blasting, sand blasting, and burning, welding, or heating surface covered with lead paint make the lead spread to the air.



02 中国含铅涂料的监管现状

I. Supervisory system of Lead Paint in China



1. 政府的监管

A. Regulation from Chinese government

中国政府致力于解决包括铅在内的重金属问题，制定了一些政策限制含铅涂料的生产和使用。

Chinese government is committed to address issues of heavy metals pollution, including lead, and have adopted some policies to limit the production and use of lead paint.

- 《产业结构调整指导目录》（2011、2013、2015），**发改委**，将“有害物质（包括铅）含量超标准的内墙、溶剂型木器、玩具、汽车、外墙涂料”与“含红丹等有害物质的涂料”列为淘汰类；

“Industrial Structure Adjustment Directory” signed by National Development and Reform Commission (NDRC) has proposed to eliminate “interior wall, woodwork, toys, cars, exterior wall paint where harmful substances (including lead) content exceed the standard” and “paint containing red lead and other harmful substances inside” ;



- 《重金属污染综合防治“十二五”规划》，**国务院批复（2011年）**，其中（三）工作重点中提到，依据重金属污染物的产生量和排放量，确定重金属污染防控的重点行业是：化学原料及化学制品制造业（基础化学原料制造和涂料、油墨、颜料及类似产品制造等）；

In 2011, State Council has also approved the “12th Five-Year Plan for Integrated Prevention and Control of Heavy Metal Pollution”

Of which (III) the focus of the work mentioned that based on generation and emissions of heavy metals pollutants to determine the key heavy metals pollution prevention and control industries ,which are as follow: Chemical raw materials and chemical products manufacturing (basic chemical raw materials manufacturing and coating, ink, pigment and similar products manufacturing, etc.) ;



三、主要任务（六）加强产品安全管理，提升民生保障水平。3.减少含重金属相关产品消费提到：减少含铅油漆、涂料、焊料的生产和使用。采取综合性调控措施，逐步抑制含重金属相关产品的市场需求。

The main task (VI) is to strengthen product safety management, and improve the level of people's livelihood security. The article of reducing the consumption of heavy metal related products mentioned to reduce the production and use of lead-based paint, coating,, solder, and take comprehensive control measures, and gradually inhibit the market demand for heavy metal related products.

- 《环境保护综合名录（2015年版）》，**环保部（2015年）**，将含铅涂料列入“高污染高环境风险产品目录”。然而，红丹在多个防腐涂料领域还在被应用，政府对此难以有效监控。

“Comprehensive Environmental Protection Directory (2015 Edition)” had listed lead paint into “high pollution and high environmental risks Catalog”. But red-lead is still widely used in anticorrosion paint, since it is hard to supervise effectively.



“产业振兴和技术改造”计划以及强基工程，**工信部（2015年）**，将化工绿色制造列为重点方向，提出发展环境友好涂料。

"Industrial Revitalization and Transformation Program" and "Strengthening Industrial Foundation Engineering" implemented by MIIT considered green chemical manufacturing as a key direction, and proposed the development of environment-friendly paint.

- 《国家鼓励的有毒有害原料（产品）替代品目录（2016年版）》，**工信部、科技部、环保部（2016年）**，包括铅在内的重金属列为优先考虑的领域，如在研发类替代——重金属替代中提到，用环保稀土颜料替代铅基和镉基颜料，应用类替代——重金属替代中提到，无铅防锈颜料替代含铅防锈颜料等。
- In 2016, MIIT and other two ministries issued a list of alternatives to hazardous materials, in which heavy metal, including lead, are priority areas.



- 《石化和化学工业发展规划（2016-2020年）》，**工信部（2016年）**，促进传统行业转型升级，传统化工提质增效工程——加强环保型涂料产品的研发和推广应用；提出绿色发展工程，清洁生产——将淘汰含铅涂料作为重点工作之一。

The elimination of lead-based paint has been listed into the Thirteen Five Plan of Chemical Industry.

- 中国涂料行业十三五发展规划，**中国涂料工业协会（2016年）**，将含铅涂料替代技术和淘汰含铅涂料列为工作重点。

The Thirteen Five Plan of China Coatings Industry which is under preparation will also focus on the alternative technologies and phase-out of leadbased paint.

□ 已有的政策都没有明确禁止含铅涂料的使用

Existing policies do not prohibit the use of lead paint definitely



此外，中国政府还制定了一些标准限制含铅涂料在某些领域的应用。

Chinese government have formulated some mandatory standards to limit the lead paint used in some fields.

序号 No.	涂料类别 Paint Category	产量 (万吨) production (million tons)	强制性铅含量限值标准 Mandatory Standard of Lead Content Restriction
1	建筑内外墙涂料 paint in indoor and outdoor of architecture	516	GB 18582-2008 室内装饰装修材料内墙涂料中有害物质限量、GB 24408-2009 建筑用外墙涂料中有害物质限量 GB 18582-2008 indoor decorating and refurbishing materials - Limit of harmful substance GB 24408-2009 paint in ourdoor decorating materials-Limit of harmful substance
2	木器涂料 woodenware paint	110	GB 18581-2009 室内装饰装修材料 溶剂型木器涂料中有害物质限量、 GB 24410-2009 室内装饰装修材料 水性木器涂料中有害物质限量 GB 18581-2009 indoor decorating and refurbshing materias of solvent based coatings for woodenware-Limit of certain harmful elements; GB 24410-2009 indoor decorating and refurbshing materias of solvent based coatings for woodenware-Limit of certain harmful elements
3	建筑钢结构涂料 paint in construction steel structure	38	GB 30981-2014 建筑钢结构防腐涂料中有害物质限量 GB 30981-2014 anticorrosive panit of construction steel structure-Limit of harmful substance
4	建筑防水涂料 construction waterproof paint	35	JC1066--2008建筑防水涂料中有害物质限量 JC1066-2008 Limit of harmful substances in construction waterproof paint



序号 No.	涂料类别 Paint Category	产量 (万吨) production (million tons)	强制性铅含量限值标准 Mandatory Standard of Lead Content Restriction
5	汽车修补漆 Automobile refinishing paint	22	无 none
6	其他钢结构涂料 (如桥梁、海洋工程等) Other steel structure paints (bridges, offshore engineering)	60	无 none
7	船舶涂料 Ship paint	33	无 none
8	粉末涂料 Powder coating	120	无 none
9	工程机械涂料 Construction machinery paint	50	无 none
10	集装箱涂料 Container paint	24.6	无 none
11	卷材涂料 Coiled material paint	40	无 none
12	其他涂料 (主要为工业防腐涂料) Other paints (mainly anti-corrosion paints in industry)	543.4	无 none



□ 含铅涂料标准存在的问题

Problems of existing standards of lead paint

- 已有标准集中在建筑内外墙、木器涂料、玩具涂料、汽车涂料、建筑钢结构涂料等部分涂料领域中，仍有大部分涂料尚缺乏强制性铅含量标准。

China' s central government has enforced a number of restriction standards to limit the use of lead-based paints in indoor and outdoor of constructions, woodenware, toys, automobile, construction steel structure and so on. Paints have many applications and China does not have a complete standard system. Most of paints do not be restricted by mandatory standard of lead content.



- 即使已经制定强制性标准的领域，铅含量标准与国外差距仍然较大

Even if there are mandatory standards in China, compared to developed countries, the difference of lead content standard is huge.

- 在船舶防污漆、环保水性涂料等领域，中国规定了推荐性标准，但难以对相应领域涂料中铅含量起到强制性的限制作用。

In fields of ship antifouling paint, environmental waterborne paints and so on, China has enforced mandatory standards, but do not play a restrictive role in these fields.



总之，中国仍缺乏淘汰含铅涂料的相关标准和监管体系

In sum, China is still lack of relevant technical capabilities, standards and regulatory system to eliminate lead paint

- 缺少法规、标准、标签和第三方认证等；

China is lack of regulations, standards, labels and third party certification;

2014年，无强制性铅含量标准的涂料产量约为894万吨，占全年总产量的54%。

In 2014, the production of paint with no mandatory lead content standard is about 8.94 million tons, and accounted for 54% of the total output of 16.48 million tons, reaching more than half.



- 现有监管措施执行力度不够，含铅涂料仍用于住宅中；

The existing regulatory measures are not enough, lead-based paint is still widely used in housing and residential;

- 政府、企业和公众对含铅涂料的环境和健康风险缺乏足够的认识；

The government, enterprises and the public are lack of sufficient knowledge on environmental and health risks of lead paint. The level of lead hazard knowledge is very low;

- 对含铅涂料生产使用情况的评估不足，由于缺乏含铅涂料的生产、使用、进出口数据，很难制定适应含铅涂料管理的国家战略。

The assessment of lead paint used in production is inadequate, due to the shortage on the production, use, import and export data of lead paint It is very difficult to develop national strategies to manage the lead paint.



2. 企业的尝试

B. the effort of enterprise

对于含铅涂料的替代品，部分国内企业曾经尝试商业化推广无铅涂料。通过添加铁钛粉末、三磷酸铝、改性磷酸锌、合成云母氧化铁、偏硼酸钡、磷酸铝、锌钼、锌铁钙等方式，无铅涂料具有与含铅涂料相当的防腐性能。

For the replacement of lead paint, some domestic enterprises have tried to promote the commercialization of lead-free paint. By adding iron titanium powder, aluminum phosphate, zinc phosphate, synthesis of micaceous iron oxide, partial barium borate, phosphate aluminum, zinc and molybdenum, zinc, iron, calcium and other additives, lead-free paint has anti-corrosion performance and lead paint.



3. 中国淘汰含铅涂料面临的困难

C. Barriers for the reduction or elimination of lead in paint production and use in China

- 没有相关法律规定铅作为原材料使用的标准；

There is no relevant law to limit the use of lead as a raw material;

- 中央和地方政府对于含铅涂料领域的监管力度薄弱；

The central and local governments for the supervision of the field of lead paint is weak;

- 缺乏明确的含铅涂料生产、使用、进口和出口产品目录；

Lack of clear lead paint production, use, import and export products catalog;

- 缺乏铅暴露对人体危害的量化数据；

Lack of quantitative data on the hazard of lead exposure on human body;



- 现有涂料标准并没有规定原料中的铅含量限值；

Existing coating standards did not limit the content of lead in raw materials;

- 涂料产品没有标明铅含量；

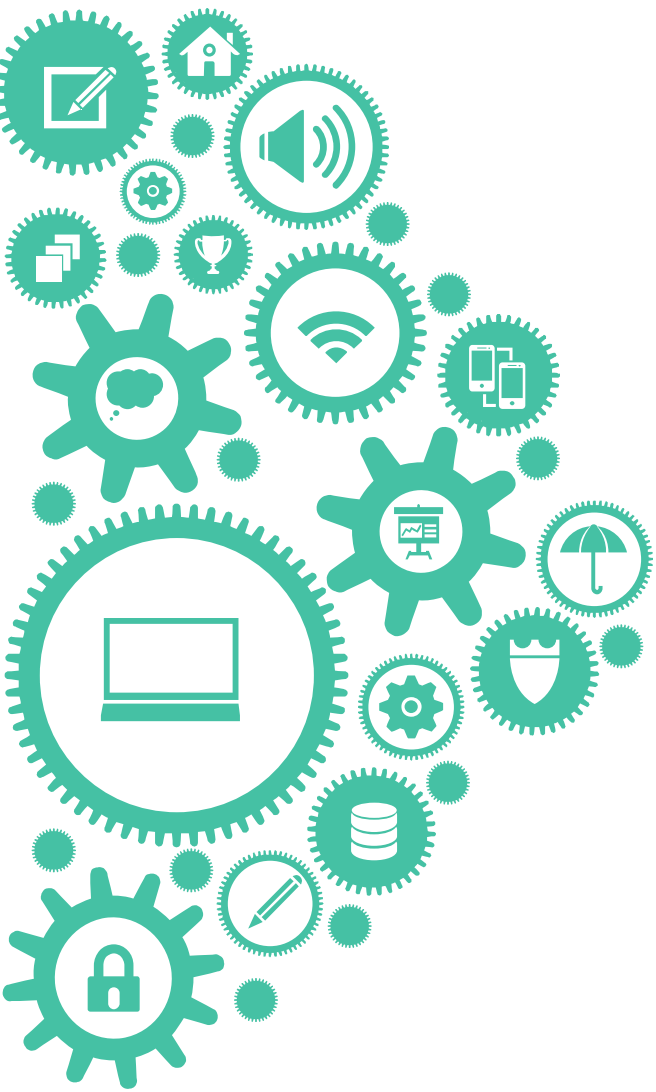
Paint products did not indicate the lead content;

- 中国缺乏铅涂料的BAT/BEP标准，并且含铅涂料替代品没有商业化；

China lacks the BAT/BEP standard for lead paint, and there is no commercial substitute for lead based paint;

- 对于含铅涂料人体和环境危害认识不强。

Knowledge of the human body and the environment is not strong for the lead paint.



03 下一步工作

III. future work



- **加强国家监管，提升国家能力和认识**

- 修订完善国家政策，逐步淘汰含铅涂料的生产和使用，提高全社会对含铅涂料危害性的认识

National policies are formulated or improved to eliminate production and use of lead paint gradually. National capacities for phase-out of production and use of lead paint are in place. Strengthen the publicity to make stakeholders aware of the harm effect of lead paint

- 建立含铅涂料目录，评估最佳可行技术评估/最佳环境实践（BAT / BEP）和替代方案

National inventory of lead paint is established, including inventory of lead paint production, use, import and export. Launch the assessment of best available techniques/ best environmental practices (BAT/BEP) and alternatives



——制定并出台淘汰含铅涂料的国家行动计划，并征询相关部门建议

National action plan to eliminate lead paint will be drafted and adopted by government and relevant stakeholders. Key findings of the action plan disseminated to national and regional stakeholders for adoption.

——对淘汰含铅涂料政策、法规和标准的执行情况进行有效监管

Monitoring and evaluation to implementation of policies, regulations, standards of eliminating lead paint. If there are enterprises which break the rules, Chinese government will punish them seriously.



● 加强国际合作

——加强和国际组织，例如联合国工业发展组织（UNIDO）、全球环境基金等交流合作，共同逐步减少并最终淘汰铅涂料的生产、使用、出口和进口

China needs to strengthen the communication with UNIDO and GEF to reduce and eliminate production, use, export and import of lead paint together;

比如，自2014年至今，在UNIDO的指导下，工业和信息化部、工信部赛迪研究院、中国涂料工业协会一直准备申请GEF的项目——中国逐步淘汰含铅涂料的生产和使用国家能力建设

From 2014 to the present, with the guidance of UNIDO, MIIT, CCID and China National Coatings Industry Association are united to apply for GEF's medium-sized project—— “Strengthening of National Capacities for the Phase-out of Production and Use of Lead -based Paint in China ”

——学习其他发展中国家经验，推动无铅涂料的商业化应用

Learn good experience of other developing countries and promote the commercialization of lead-free paint



Thanks