



LEAD IN SOLVENT-BASED PAINTS FOR HOME USE IN THE REPUBLIC OF MOLDOVA



October 2016





a toxics-free future

National Report

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Acknowledgements

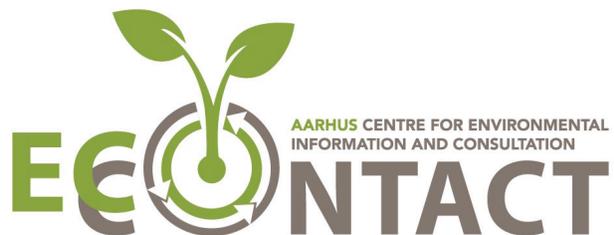
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While this study was undertaken with the assistance of the Swedish International Development Cooperation Agency (SIDA) and New York Community Trust (NYCT), its contents are the sole responsibility of Public Association EcoContact together with IPEN, and can in no way be taken to reflect the views of SIDA and NYCT.

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PREFACE

Lead paints for home use continue to be widely produced, sold, and used in developing countries despite the fact that most highly industrial countries banned lead paints for household use more than 40 years ago. IPEN and Participating Organizations are part of the global movement to eliminate lead paint by 2020 to protect children's health.

In 2007 and 2008, NGOs in the IPEN network collected and analyzed decorative (home use) paints on the market in 11 developing countries, and in countries with economies in transition. The results were startling. In every one of these countries, many of the paints contained dangerously high lead levels. In response, IPEN launched its Global Lead Paint Elimination Campaign, which seeks to eliminate lead in paint and raise widespread awareness among business entrepreneurs and consumers about the adverse human health impacts of lead paint, particularly on the health of children. Since then, IPEN-affiliated NGOs and others have sampled and analyzed paints on the market in approximately 40 low- and middle-income countries.

This report presents new data on the total lead content of solvent-based paints for home use available on the market in the Republic of Moldova. It also presents background information on why the use of lead paint is a source of serious concern, especially to children's health; a review of national policy frameworks that are in place to ban or restrict the manufacture, import, export, distribution, sale and use of lead paint, and provides a strong justification to adopt and enforce further regulatory controls in Moldova. Finally, it proposes action steps by different stakeholders to protect children and others from lead paint.

This study was conducted by the Public Association EcoContact in partnership with IPEN and the Ministry of Environment of the Republic of Moldova.

IPEN is an international NGO network of health and environmental organizations from all regions of the world of which Public Association EcoContact is a member. IPEN is a leading global organization working to establish and implement safe chemicals policies and practices to protect human health and the environment. Its mission is a toxics-free future for all. IPEN helps build the capacity of its member organizations to implement on-the-ground activities, learn from each other's work, and work at the international level to set priorities and achieve new policies.

The Public Association EcoContact is a successor of the local office of Milieu-kontakt International in Moldova and continues to be partner of Milieukontakt International Amsterdam office. EcoContact which was registered on August 2nd, 2010, has a rich history of activities starting from 2001 when Milieu-kontakt International in Moldova started projects on environmental and civil society issues. The main areas of activity are: public participation and access to information on environmental matters; management of waste, toxic waste (obsolete pesticides), water; soil remediation; disaster risk reduction and vulnerability; supporting in drafting and promoting political documents on environment at local and national level, drafting and implementing environmental, civil society laws; establishing partnership and cooperation relations with stakeholders (authorities, business and NGOs); representing interest in international forums on environmental issues. Staff of EcoContact has environmental, scientific, legal, educational background and are actively involved at national, local and international level in promoting environmental values. They also have good experiences in working with international experts and donors. Since 2013, EcoContact is hosting the Environmental Consultation and Information Aarhus Center, created with support with OSCE Mission in Moldova. The main areas of activity are divided into five main domains:

Information management: ensuring an information flow for environmental NGO sector, contributing to promote transparency and ensuring the right to an opinion and access to information);

Capacity building: (our trainers are using the Kolb approach for adults' education while providing the thematic trainings on environmental management, development NGOs capacities/viability, on environmental legislation and environmental human rights, etc.)

Participation: EcoContact is actively involved in environmental decision-making process at local, regional and national levels. We are doing this by presenting the organization's opinion and representing NGOs society, providing pilot events and elaborating recommendations, being an active member of thematic working groups and councils;

Consultations: EcoContact is offering consultations on application of environmental legislation, ensuring the environmental human rights, and guiding in application the access to justice in environmental matters at national and international levels, offering consultation in policy and law drafting processes.

Solving environmental problems: The main thematic areas of EcoContact's activity are: chemicals, toxic waste (obsolete pesticides), waste management, water management, disaster risk reduction, and soil remediation.

PA EcoContact is an IPEN member since 2015, thereby becoming a member of the IPEN global network and IPEN EECCA Regional Hub. Since 2011, Mrs. Iordanov Rodica, EcoContact's Executive Director, is the SAICM NGO focal point in Moldova and EcoContact is a member of the European ECO Forum (reconfirmed in 2016).

On 23-27 September 2013, EcoContact participated in the National Chemicals Safety Week (with half a year of preparatory stage). During the National Chemicals Safety week, among others, a leaflet about the impact of lead in paints was developed and disseminated, but due to limited resources, no laboratory analyses of lead in paints was carried out (only POPs, nitrates and heavy metals in food products (vegetables, fruits, eggs, milk products and fish)).

In addition, EcoContact participated in the following activities: POPs NIP development and implementation (since 2003), promotion of POPs elimination and sites remediation (since 2005, with practical remediation works), food safety and sustainable chemicals use in agriculture (since 2013). EcoContact also conducted the national waste management and legal assessment of POPs in Moldova (2014-2015) and cooperated with Eco-Accord and IPEN on the assessment of toxic chemicals in toys (reflected in final national publication and dissemination of the regional study).

EcoContact administers the environmental NGOs communication and information distribution network and organizes environmental NGOs Forums. EcoContact has good collaboration experience with all environmental NGOs in Moldova, and gained experience from collaboration with NGOs from the EU and EECCA regions, carrying daily activities of the Aarhus Environmental Information and Consultation Centre/EcoContact.

EcoContact is member of POPs, PRTR, SAICM, Aarhus and Green Economy Working Groups, organized by the Government/Ministry of Environment of Moldova. EcoContact actively participates in development, coordination, and consultation of public policies, and contribute to public participation, dissemination of information and support access to justice on environmental matters (real cases in court). EcoContact was a member of the official delegation of Moldova at Rio+20, participated in Environment for Europe Process, and registered for Batumi Ministerial, Georgia, in June 2016.

EXECUTIVE SUMMARY

Lead is a toxic metal that causes adverse effects on both human health and the environment. While lead exposure is also harmful to adults, lead exposure harms children at much lower levels, and the health effects are generally irreversible and can have a lifelong impact.

The younger the child, the more harmful lead can be, and children with nutritional deficiencies absorb ingested lead at an increased rate. The human fetus is the most vulnerable, and a pregnant woman can transfer lead that has accumulated in her body to her developing child. Lead is also transferred through breast milk when lead is present in a nursing mother.

Evidence of reduced intelligence caused by childhood exposure to lead has led the World Health Organization (WHO) to list “lead-caused mental retardation” as a recognized disease. WHO also lists it as one of the top ten diseases whose health burden among children is due to modifiable environmental factors.

Lead paint is a major source of childhood lead exposure. The term lead paint is in this report used as defined in the U.S Consumer Product Safety Act, as any paint or other similar surface coating materials containing lead or lead compounds and in which the lead content is in excess of 0.009 percent by weight of the dried paint film.

Most highly industrial countries adopted laws or regulations to control the lead content of decorative paints—the paints used on the interiors and exteriors of homes, schools, and other child-occupied facilities—beginning in the 1970s and 1980s. The paint market in Moldova is a booming industry due to imports and domestic production, but is not protected from illegal, falsified and low quality products. EU accession rules on chemicals management, import and market control are not properly enforced and are at the early stages of implementation. Because of its transitioning economy and unstable political and social situations, the population prefers cheap painting products and do not take precautionary measures when applying chemical products. Knowledge and awareness about links of public health and environmental quality issues about lead in paints are very low.

The Government approved the National Chemicals Profile (2008) and the Program on sustainable use of chemicals (2010). The Ministry of Environment developed the draft law on chemicals, in which heavy metals and toxic chemi-

cals like lead are listed to be restricted or their use banned. Due to unstable political situation during the last two years, this draft law was not promoted. However, the Government supports NGOs initiatives, which highlight priority issues and support promotion of legal or strategic documents in toxic chemicals management.

From 15 July to 10 August 2016, the Public Association EcoContact purchased a total of 28 cans of solvent-based paint intended for home use from stores in Chisinau, Republic of Moldova. The paints represented 12 different brands produced by 12 manufacturers. All paints were analyzed by an accredited laboratory in the United States of America for their total lead content, based on dry weight of the paint. The laboratory participates in the Environmental Lead Proficiency Analytical Testing (ELPAT) program operated by the American Industrial Hygiene Association (AIHA), assuring the reliability of the analytical results.

RESULTS

Sixteen out of 28 of the analyzed solvent-based paints for home use (57 percent of paints) were lead paints, i.e., they contained a total lead concentration above 90 parts per million (ppm), dry weight. This is also the regulatory limit for lead in decorative paint in the Philippines, Nepal and the United States of America. In addition, 10 out of 28 paints (36 percent of paints) contained a total lead concentration of 600 ppm – the regulatory limit for lead in decorative paint in Brazil, South Africa and Sri Lanka. Moreover, five paints (18 percent of paints) contained dangerously high lead concentrations above 10,000 ppm. The highest total lead concentration detected was 83,000 ppm in a Si Belle red paint manufactured by Ninachim in Bulgaria.

On the other hand, 12 out of 28 solvent-based paints for home use (43 percent of paints) contained total lead concentrations below 90 ppm, suggesting that the technology to produce paint without lead ingredients exists in Moldova.

Seven out of 12 analyzed brands (58 percent of paint brands) sold at least one lead paint, i.e., a paint with total lead concentration above 90 ppm. Also, four out of 12 analyzed brands (33 percent of paint brands) sold at least one lead paint with dangerously high lead concentrations above 10,000 ppm.

Yellow paints most frequently contained dangerously high lead concentrations above 10,000 ppm. Four out of nine yellow paints (44 percent of yellow paints) and one out of eight red paints (12 percent of red paints) contained lead levels above 10,000 ppm.

In general, paint can labels did not carry meaningful information about lead content or the hazards of lead paint. In fact, all paints analyzed in this study did not provide information about lead on their labels and most paints carried little information about ingredients. Most paints were merely labeled as “solvents, pigments and resin,” with no further details on the type of solvents and pigments (organic or inorganic) were provided. Manufacturing dates were present in all paint can labels, while batch numbers were included on the labels of 24 out of 28 paints (86 percent of paints) included in this study. Most warning symbols on the paint cans indicated the flammability of the paints, while other warnings include “Harmful for water resources,” “Avoid discharge in environment,” “Irritant,” “Keep away out of reach of children,” but no precautionary warnings on the effects of lead dust to children and pregnant women were provided.

CONCLUSIONS

This study demonstrates that solvent-based paints for home use with high concentrations of lead are widely available in Moldova since the paints included in this study are brands commonly sold in retail stores and markets. However, the fact that 12 out of 28 paints (43 percent of paints) contained lead concentrations below 90 ppm indicates that the technology to produce paints without added lead exists in Moldova and can be imported into the country from nearby regions. The study results provide a strong justification to adopt and enforce a regulation that will ban the manufacture, import, export, distribution, sale and use of paints with total lead concentrations greater than 90 ppm.

RECOMMENDATIONS

To address the problem of lead in paint, the Public Association EcoContact and IPEN propose the following recommendations:

Government and Government Agencies

The Government should enforce the implementation of the laws banning lead in paints, such as changes in law on air and draft law on chemicals.

A specific regulation could supplement the legislation that support implementation measures to ban the manufacture, import, export, distribution, sale and use of paints that contain total lead concentrations exceeding 90 ppm, the most restrictive standard in the world. They should also require paint companies to display sufficient information indicating harmful content on paint can labels such as solvents and provide a warning on possible lead dust hazards when disturbing painted surfaces.

Paint Industry and Importers

Paint companies that still produce lead paints should expeditiously stop the use of leaded paint ingredients in paint formulations. Paint companies that have shifted to non-lead paint production should get their products certified through independent, third party verification procedures to increase the customer's ability to choose paints with no added lead. Importers of paints to Moldova should stop the import of lead-paints.

Individual, Household and Institutional Consumers

Paint consumers should demand paints with no added lead from paint manufacturers and retailers, as well as full disclosure of a paint product's lead content. Household and institutional consumers should ask for, consciously buy, and apply only paints with no added lead in places frequently used by children such as homes, schools, day care centers, parks and playgrounds.

Organizations and Professional Groups

Public health groups, consumer organizations, environmental NGOs and other concerned entities should support the elimination of lead paint, and conduct activities to inform and protect children from lead exposure through lead paint, lead in dust and soil, and other sources of lead.

All Stakeholders

All stakeholders should come together and unite in promoting a strong policy that will eliminate lead paint in Moldova. Awareness and information on elimination of lead in paints, environmental and health risks have to be conducted.

1. BACKGROUND

1.1 HEALTH AND ECONOMIC IMPACTS OF LEAD EXPOSURE

Children are exposed to lead from paint when lead-containing paint on walls, windows, doors or other painted surfaces begins to chip or deteriorate, since this causes lead to be released to dust and soil. When a surface previously painted with lead paint is sanded or scraped in preparation for repainting, very large amounts of lead-contaminated dust is produced, which, when spread, can constitute a severe health hazard.^[1]

Children playing indoors or outdoors get house dust or soil on their hands, and then ingest it through normal hand-to-mouth behavior. If the dust or the soil is contaminated with lead, the children will ingest lead. Hand-to-mouth behavior is especially prevalent in children aged six years and under, the age group most easily harmed by exposure to lead. A typical one- to six-year-old child ingests between 100 and 400 milligrams of house dust and soil each day.^[2]

In some cases, children pick up paint chips and put them directly into their mouths. This can be especially harmful because the lead content of paint chips is typically much higher than what is found in dust and soils. When toys, household furniture, or other articles are painted with lead paint, children may directly ingest the lead-contaminated, dried paint when chewing on them. Nonetheless, the most common way that children ingest lead is through lead-contaminated dust and soil that gets onto their hands.^[3]

While lead exposure is also harmful to adults, lead exposure harms children at much lower levels. In addition, children absorb up to five times as much of ingested lead than adults. Children with nutritional deficiencies absorb ingested lead at an even increased rates.^[2]

The younger the child, the more harmful lead can be and the health effects are generally irreversible and can have a lifelong impact. The human fetus is the most vulnerable, and a pregnant woman can transfer lead that has accumulated in her body to her developing child.^[4] Lead is also transferred through breast milk when lead is present in a nursing mother.^[5]

Once lead enters a child's body through ingestion, inhalation, or across the placenta, it has the potential to damage a number of biological systems and pathways. The primary target is the central nervous system and the brain, but

lead can also affect the blood system, the kidneys, and the skeleton.^[6] Lead is also categorized as an endocrine-disrupting chemical (EDC).^[7]

It is generally agreed that one key element in lead toxicity is its capacity to replace calcium in neurotransmitter systems, proteins, and bone structure, altering function and structure and thereby leading to severe health impacts. Lead is also known to affect and damage cell structure.^[8]

According to the World Health Organization (WHO): “Lead has no essential role in the human body, and lead poisoning accounts for about 0.6 percent of the global burden of disease”.^[2] Evidence of reduced intelligence caused by childhood exposure to lead has led WHO to list “lead-caused mental retardation” as a recognized disease. WHO also lists it as one of the top ten diseases whose health burden among children is due to modifiable environmental factors.^[9]

In recent years, medical researchers have been documenting significant health impacts in children from lower and lower levels of lead exposure.^[2, 6] According to the factsheet on Lead Poisoning and Health from WHO: “There is no known level of lead exposure that is considered safe.”^[10]

The term lead paint is in this report used as defined in the U.S Consumer Product Safety Act, as any paint or other similar surface coating materials containing lead or lead compounds and in which the lead content is in excess of 0.009 percent by weight of the dried paint film.

When a young child is exposed to lead, the harm to her or his nervous system makes it more likely that the child will have difficulties in school and engage in impulsive and violent behavior.^[11] Lead exposure in young children is also linked to increased rates of hyperactivity, inattentiveness, failure to graduate from high school, conduct disorder, juvenile delinquency, drug use, and incarceration.^[2] Lead exposure impacts on children continue throughout life and have a long-term impact on a child’s work performance, and—on average—are related to decreased economic success.

A recent study investigating the economic impact of childhood lead exposure on national economies in all low- and middle-income countries estimated a total cumulative cost burden of \$977 billion international dollars¹ per year.^[12]

1 An International dollar is a currency unit used by economists and international organizations to compare the values of different currencies. It adjusts the value of the U.S. dollar to reflect currency exchange rates, purchasing power parity [PPP], and average commodity prices within each country. According to the World

The study considered the neurodevelopmental effects on lead-exposed children, as measured by reduced IQ points, and it correlated lead exposure-related reductions in children's IQ scores to reductions in lifetime economic productivity, as expressed in lifelong earning power. The study identified many different sources of lead exposure in children, with lead paint as one major source. Broken down by region, the economic burden of childhood lead exposure as estimated by this study was:

- **Africa:** \$134.7 billion of economic loss, or 4.03% of Gross Domestic Product (GDP)
- **Latin America and the Caribbean:** \$142.3 billion of economic loss, or 2.04% of GDP
- **Asia:** \$699.9 billion of economic loss, or 1.88% of GDP.

Country estimates used in this study can be accessed at a publically available website, <http://www.med.nyu.edu/pediatrics/research/environmentalpediatrics/leadexposure>. Data for Moldova was not included in the aforementioned study.

1.2 THE USE OF LEAD IN PAINT

Paints contain high levels of lead when the paint manufacturer intentionally adds one or more leaded compounds to the paint for some purpose. A paint product may also contain some amount of lead when paint ingredients contaminated with lead are used, or when there is cross-contamination from other product lines in the same factory. Water-based paints are rarely contaminated with lead, but solvent-based paints have been found to have high lead content in many countries.^[13-15]

The leaded compounds most commonly added to paints are pigments. Pigments are used to give the paint its color, make the paint opaque [so it covers well], and protect the paint and the underlying surface from degradation caused by exposure to sunlight. Lead-based pigments are sometimes used alone, and sometimes used in combination with other pigments.

Leaded compounds also may be added to enamel paints for use as driers (sometimes called drying agents or drying catalysts). Leaded compounds are also sometimes added to paints used on metal surfaces to inhibit rust or corrosion. The most common of these is lead tetroxide, sometimes called red lead or minium.

Bank, "An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States." The international dollar values in this report were calculated from a World Bank table that lists GDP per capita by country based on purchasing power parity and expressed in international dollars..

Non-lead pigments, driers, and anti-corrosive agents have been widely available for decades, and are used by manufacturers producing the highest quality paints. When a paint manufacturer does not intentionally add lead compounds in the formulation of its paints, and takes care to avoid the use of paint ingredients that are contaminated with lead, the lead content of the paint will be very low—less than 90 parts per million [ppm] total lead by dry weight, and frequently down to 10 ppm or less.

Most highly industrial countries adopted laws or regulations to control the lead content of decorative paints beginning in the 1970s and 1980s. Many also imposed controls on the lead content of paints used on toys and for other applications likely to contribute to lead exposure in children. These regulatory actions were taken based on scientific and medical findings that lead paint is a major source of lead exposure in children, and that lead exposure in children causes serious harm, especially to children aged six years and under.

The use of lead in production of decorative paint is prohibited in the European Union through regulations related to safety of consumer products and specific prohibitions for most leaded raw materials. In the U.S., Canada, Australia and other countries with regulations restricting the use of leaded ingredients in decorative paint, standards specifying a maximum lead limit are in place. The current standard for household paints in the U.S., the Philippines, and Nepal is 90 ppm total lead, and adherence to this ensures that a manufacturer can sell its paint anywhere in the world. Some other countries such as Singapore and Sri Lanka have established standards of 600 ppm total lead.

1.3 PAINT MARKET AND REGULATORY FRAMEWORK IN THE REPUBLIC OF MOLDOVA

From the available information on the dynamics of import and production, the import, production and sales of paints in Moldova is increasing every year.

According to the law, statistics like volumes of production are considered commercial confidential data, so, in the annual reports of the National Bureau of Statistics (NBS), only general data per sector were presented as shown in Table 1.

TABLE 1. ANNUAL PRODUCTION OF PAINTS IN MOLDOVA

Year	Volume of Lacquers and Paints (tonnes)
2007	10,815
2008	11,557
2009	11,822
2010	12,864
2011	18,011
2012	17,907
2013	12,345
2014	17,685

Source: NBS, 2015, www.statistica.md

Data on imports was requested by the Ministry of Environment (EPPO Office) from the Customs Service, but, as it is considered confidential, covering the import volumes per private companies could not be disseminated at the moment. On the NBS website, only general figures are indicated (Table 2). Processed data will be requested and provided in addition.

TABLE 2. TOTAL AMOUNT OF IMPORTED PAINTS TO MOLDOVA (2015)

Imported Product	Amount (USD)
Dyeing, tanning and coloring materials	27,668.9

Source: NBS, 2015, www.statistica.md

Due to these facts, data on imports, production and sales of a particular paint brand could not be properly evaluated and presented. This fact also did not allow making a comparative evaluation of imported or manufactured paints, but an expert judgment demonstrates that based on sales, two-thirds of paints are imported and one-third is locally produced.

Based on the collected survey information during visits to paint markets and stores, the following brands were sold in bigger volumes: Rastsvet, Dachnaya (Empils), Sniezka (Sniezka), Enamel PF-115 (Empils), Leko (Orgachim), si Belle (Ninachim), Enamel (Khimrezerv), Eurostil (Supraten), Paritet (Rolax), and Harmony (Tikkurila). Other brands were sold in smaller volumes. Imported paints mainly came from Russia, Bulgaria, Poland, Ukraine and Fin-

land. Paints from the USA, Germany, UK and Sweden were present on the market, but due to high cost (sometimes 10 times higher than the average cost of paints), these brands were sold in smaller amounts. Products from Romania and Turkey were noted in previous surveys, but were not available on the market when the purchase of paints were conducted.

Paints in smaller volumes were found in open district markets. These paints, imported or manufactured in Moldova for Moldovan companies, did not properly provide the names of its importer or producer on its labels. Such brands like “RasKraS,” “Bor,” “Krasovo,” “Palitra,” “NOVA,” and “Mesterul casei tale” appeared in few single units on the market. In addition, some brands like “Denber” were only available for sale on the internet.

LEGAL AND REGULATORY FRAMEWORK

The national legal and regulatory framework in Moldova are presented through the following documents:

The Law on environmental protection, nr. 1515 of 16.06.1993 (with changes)

This law sets up the legal base for environmental protection in the Republic of Moldova. According to the law, the central public authorities the governmental authorities have the right to establish the limits or ban hazardous substances, in order to reduce or eliminate impact or pollution from heavy metals, also based on the provisions of the MEAs to which Moldova is a party.

The Law on the protection of the atmospheric air, nr. 1422 of 17.12.1997 (with changes and amendments)

This law sets up the legal framework for the protection of air, regulation and management of the pollution of the atmospheric air, and sets up the responsibilities of governmental institutions and private companies.

According to the changes in the law (Law nr.141 of 17 June 2016), the following list of chemical substances for constructions is prohibited: asbestos or articles which contain asbestos; lead (carbonates (CAS nr. 598-63-0 and 1319-46-6) and sulfates (CAS nr. 7446-14-2 and 15739-80-7)), compounds of mercury, cadmium used for paints, protection of wood, industrial waters treatment, imprints on textiles, for covering walls etc. Since the entrance in force of the Law nr. 141, the retail of paints containing these substances is prohibited.

Law on payment for environmental pollution nr. 1540 of 25.02.1998 (with amendments)

The law sets up the procedures for payment for environmental pollution or for goods and products, which contain harmful substances for environment and health. For lead and products containing lead, the set up includes a payment normative and a percentage from the cost of the product.

Technical Regulation on the toys safety nr 808 of 29.10.2015

The regulation sets up all procedures related to toys safety, including the allowed concentrations of toxic substances in toys, including heavy metals and substances in paints for toys.

Sanitary Regulation on the objects from ceramics, glass, with enamel coverage which come in contact with food products nr 493 of 11.08.2015

The regulation sets up the list of objects and substances which have to be investigated. The levels of migration for lead and the laboratory analyses methodology are set up.

Technical Regulation on the products for construction, Governmental Decision nr. 226 of 29.02.2008

The regulation sets up the procedure for ensuring the quality of materials used for construction, and sets up the groups of products and domains of regulation, which are exposed to the conformity check.

The paints (including enamels) are subject of this regulation and of the quality evaluation. Products can only be placed on the market if the provisions of the technical regulation were met and the products bear the national mark SM, which denotes adherence to the declaration of conformity. The documentation should contain the following description: general description of the product, description of the modality of use, list of standards, results of evaluation, including the hazardous factors, their real level and maximal allowed concentrations, and certificate of correspondence.

Environmental Strategy for 2014-2023 and Action Plan for its implementation nr.301 of 24.04.2014

The strategic document has the general goal to set up the legal and institutional framework in the country for the environmental protection and sustainable development, and indicate specific sectorial objectives and indicators.

Chemicals management and reduction of pollution are among priorities. The inventory of articles and products which contain mercury and its compounds, of paints containing lead and its compounds are among the activities for the first five years of implementation of the action plan as short term actions.

The National Programme on sound management of chemicals, approved by the Governmental Decision nr. 973 from 18.10.2010 establishes goals, objectives and actions needed for developing an integrated system of chemicals management being efficient from the technical, economic, social and environmental points of view.

The Programme outlines strategic directions for the management of chemical substances, including waste, outlined in National Development Strategy for 2008-2011, approved by Law no. 295-XVI of 21 December 2007, and National Strategy on reduction and elimination of persistent organic pollutants, approved by Government Decision no. 1155 of 20 October 2004. 3. The Programme is the main document of long term strategic planning, which determines the development objectives of the sound chemicals management system until 2020.

The main purpose of this Programme is to ensure sound management of chemicals. It is also aimed at creating and implementing an integrated and effective management of chemicals, which would result in implementation of international environmental treaties and Strategic Approach to International Chemicals Management.

Among the priority indicators are the development of the profile of priority chemical substances: asbestos, mercury, lead and cadmium is inventoried and evaluated according to their characteristics.

The draft law on chemicals (Ministry of Environment, 2016)

The law indicates that the list of toxic substances, restricted or banned will be approved by special legislation. This cover most of heavy metals, including lead and products, in which lead or its compounds are used.

In Moldova the International Lead Poisoning Prevention Week in the WHO European Region, 20-26 October 2013, WHO ROE was marked.

In the Republic of Moldova, the campaign was arranged in accordance with the Order of the Ministry of Health on the organization of lead poisoning prevention week. The event was announced on the websites of the Ministry of Health and the National Public Health. Current scientific information on the impact

of lead on health and the results of a recent analysis of situation in the country were included in the latest newsletter of the Academy of Sciences of the Republic of Moldova to draw the attention of the scientific community and the Government to the problems caused by lead contamination. An article published in the national journal, *Evenimentul Zilei*, provided information on soil pollution in the country, and on action proposed to minimize the impact of lead through contaminated soil. A national multi-stakeholders workshop was organized in the Public Health Institute, Chisinau, on 24 October 2013, during which the main sources of lead exposure in the Republic of Moldova, the impact of lead pollution on the health of the population, and the results of recent scientific surveys were discussed and directions for future research identified. A special session on the prevention of lead poisoning was held on 25 October 2013 within the framework of the Congress of Public Health Specialists of the Republic of Moldova, which took place in Chisinau during the international lead poisoning prevention week of action. The main outcome of the session was the decision to develop an intersectoral action plan with the main objective of eliminating lead compounds from products used in different economic domains. On 24 October, a programme on lead contamination (“*Stirile Zilei la ProTV de la ora 20.00 cu Angela Gonta*”) was aired on national television. National Public Health Institute of the Republic of Moldova, Chisinau. Interview for national television on the international lead poisoning prevention week of action.

EcoContact, in partnership with the Ministry of Environment, EPPO Office participated in the observance of the National Chemicals Safety Week (with half a year of preparatory stage) on 23-27 September 2013. During the National Chemicals Safety week, among others, a leaflet about the impact of lead in paints was developed and disseminated, but due to limited resources, no laboratory analyses of lead in paints was carried out (only POPs, nitrates and heavy metals in food products (vegetables, fruits, eggs, milk products and fish). With the support from IPEN for this week, heavy metals in toys were assessed and presented at national and international levels, and a brochure was printed.

The sub-regional conference on Lead in Paint, Chisinau, Moldova, May 2016

On 19-20 May 2016 in Chisinau, the Central and Eastern Europe and Central Asia Regional Workshop on the Establishment of Legal Limits on Lead in Paint took place, being organized by UNEP (ROE), in partnership with WHO, Ministry of Environment, Ministry of Health.

PA EcoContact was invited and attended this workshop.

The Republic of Moldova (represented by the Ministry of Health) is a member of the Global Alliance to Eliminate Lead Paint (GAELP), also known as Lead Paint Alliance.

2. MATERIALS AND METHODS

From 15 July to 10 August 2016, 28 cans of solvent-based paint intended for home use were purchased by the Public Association EcoContact from various stores and markets in Chisinau, capital city of the Republic of Moldova. The paints represented 12 different brands produced by 12 manufacturers. The places of purchase includes:

- Zikkurat Market (construction materials, Botanica, Chisinau)
- Supraten Supermarket (construction materials, Mesterul Manole, Ciocana, Chisinau)
- Central Market (fruits, vegetables and household products market, city center, Chisinau)
- Supraten Market (Orasul Mesterilor, Petricani, Chisinau)
- District Market (fruits, vegetables and household products market, Ciocana District, Chisinau)

Based on the collected survey information during visits to paint markets and stores, the following brands were sold in bigger volumes: Rastsvet, Dachnaya (Empils), Sniezka (Sniezka), Enamel PF-115 (Empils), Leko (Orgachim), si Belle (Ninachim), Enamel (Khimrezerv), Eurostil (Supraten), Paritet (Roxolax), and Harmony (Tikkurila). Other brands were sold in smaller volumes. Imported paints mainly came from Russia, Bulgaria, Poland, Ukraine and Finland. Paints from the USA, Germany, UK and Sweden were present on the market, but due to high cost (sometimes 10 times higher than the average cost of paints), these brands were sold in smaller amounts. Products from Romania and Turkey were noted in previous surveys, but were not available on the market when the purchase of paints were conducted.

In most cases, one white paint and one or more bright-colored paint such as red, orange or yellow were selected. Additionally, one anti-corrosive paint for consumer use was also included in this study. The availability of this paint in retail establishments suggested that this was intended to be used within home environments. Excluded were automotive and industrial paints that are not typically used for domestic housing applications.

During the paint sample preparation, information such as color, brand, manufacturer, country where manufactured, product codes, production dates, and other details as provided on the label of the paint can were recorded. Generic



Figure 1: Assessment of brands and purchase of paints, 2016

paint colors were recorded, e.g., “yellow” instead of “sunflower.” For all colored paints, the protocol called for obtaining “bright” or “strong” red and yellow paints when available.

Paint sampling preparation kits containing individually numbered, untreated wood pieces, single-use paintbrushes and stirring utensils made from untreated

wood sticks were assembled and shipped to Public Association EcoContact by the staff of the IPEN partner NGO, Arnika, in The Czech Republic.

Each can of paint was thoroughly stirred and was subsequently applied onto individually numbered triplicates of untreated, labelled wood pieces using different unused, single-use paintbrushes by a researcher of Public Association EcoContact as shown in Figure 2 below.



Figure 2: Sample preparation, EcoContact, 10 August 2016

Each stirring utensil and paintbrush was used only for the same paint, and extra caution was taken to avoid cross contamination. All samples were then allowed to dry at room temperature for five to six days. After drying, the painted wood pieces were placed in individually labelled, resealable plastic bags and shipped for analysis of total lead content to Forensic Analytical Laboratories, Inc. in the United States of America. The laboratory participates in the Environmental Lead Proficiency Analytical Testing (ELPAT) Program operated by the American Industrial Hygiene Association. In the laboratory selection process, IPEN further assessed the reliability of the laboratory results by conducting an independent quality assurance testing. This was made by sending paint samples with a known lead content to the laboratory, and evaluating the results received.

The laboratory's lower limit of detection for the lead concentration in the paint samples is dependent on the amount of paint in the samples. Generally, the lowest detection limit for the method used is 60 ppm, but if only a small amount of paint is available, the detection limit increases.

The paint samples were analyzed using method EPA3050B/7420, i.e., through acid digestion of the samples, followed by Flame Atomic Absorption Spectrometry, as recognized by the WHO as appropriate for the purpose.^[16]

3. RESULTS

3.1. SUMMARY OF RESULTS

This study shows that:

- 16 out of 28 analyzed solvent-based paints (57 percent of paints) were lead paints, i.e., they contained a total lead concentration above 90 parts per million (ppm), dry weight. In addition, 5 paints (18 percent of paints) contained dangerously high lead concentrations above 10,000 ppm.
- 7 out of 12 analyzed brands (58 percent of paint brands) sold at least one lead paint, i.e., a paint with total lead concentration above 90 ppm. Also, 4 out of 12 analyzed brands (33 percent of paint brands) sold at least one lead paint with dangerously high lead concentrations above 10,000 ppm.
- 13 out of 17 bright-colored paints (76 percent of bright-colored paints) were lead paints, i.e., they contained a total lead concentration above 90 parts per million (ppm), dry weight. Yellow paints were the most hazardous with 4 out of 9 paints (44 percent of yellow paints) containing total lead concentrations greater than 10,000 ppm; 1 out of 8 red paints (12 percent of red paints) also contained lead levels above 10,000 ppm.
- The highest lead concentration detected was of 83,000 ppm in a red Si Belle paint produced by Ninachim in Bulgaria, and sold in Moldova for home use.
- All paints did not provide information about lead on their labels and most paints carried little information about ingredients. Most paints were merely labeled as “solvents, pigments and resin,” with no further details on the type of solvents and pigments (organic or inorganic) provided. Most warning symbols on the paint cans indicated the flammability of the paints, while other warnings included “Harmful for water resources,” “Avoid discharge in environment,” “Irritant,” and “Keep away out of reach of children,” but no precautionary warnings on the effects of lead dust to children and pregnant women were provided.

3.2 TOTAL LEAD CONTENT ANALYSIS

16 out of 28 of the analyzed solvent-based paints (57 percent of paints) were lead paints, i.e. contained a lead concentration above 90 ppm —5 of these con-

tained dangerously high lead concentrations above 10,000 ppm (18 percent of paints).

A red Si Belle paint from Bulgaria contained the highest concentration of lead at 83,000 ppm, while the lowest concentration of lead less than 60 ppm was detected in 12 paints from the following brands: Sniezka (white, red, yellow), Dali (red), Leko (white), Paritet (white), Si Belle (white), Khimrezerv (white), Harmony (white), Zebra (white), Dekart (white), and Aur-M (yellow).

The 10 solvent-based paints with the highest amounts of lead are summarized in Table 3.

TABLE 3. TOP 10 SOLVENT-BASED PAINTS WITH THE HIGHEST LEAD CONTENT

Rank	Sample No.	Brand	Manufacturer	Color	Lead Content (ppm)
1	MOL-18	Si Belle	Ninachim, Bulgaria	red	83,000
2	MOL-17	Si Belle	Ninachim, Bulgaria	yellow	35,000
3	MOL-20	PF-115	Khimrezerv, Ukraine	yellow	23,000
4	MOL-23	Palitra	Cheton-Group, Moldova	yellow	16,000
5	MOL-14	Paritet	Rolax, Ukraine	yellow	14,000
6	MOL-15	Paritet	Rolax, Ukraine	red	6,300
7	MOL-22	Palitra	Cheton-Group, Moldova	white	1,500
8	MOL-01	Rastsvet	Empils, Russia	white	1,400
9	MOL-03	Rastsvet	Empils, Russia	red	1,000
10	MOL-02	Rastsvet	Empils, Russia	yellow	930

3.3 PAINT BRAND ANALYSIS

4 out of 12 analyzed brands (33 percent of paint brands) sold at least one paint with dangerously high lead concentration above 10,000 ppm

Among solvent-based decorative paints, a red Si Belle paint manufactured in Bulgaria contained the highest concentration of lead at 83,000 ppm. It was followed by paints from Ukraine, Moldova and Russia. On the other hand, at least one paint from each of the following brands contained lead below 90 ppm: Sniezka, Dali, Leko, Paritet, Si Belle, Khimrezerv, Harmony, Zebra, DekArt, and

Aur-M. This indicates that the technology to produce paint without added lead exists in Moldova and nearby regions.

Among the anti-corrosive paints, Dali, manufactured by Rogneda in Russia contained the highest concentration of lead at 160 ppm.

3.4 PAINT COLOR ANALYSIS

13 out of 17 bright-colored paints (76 percent of bright-colored paints) such as yellow and red contained lead concentrations above 90 ppm, 5 paints of which contained dangerously high lead concentrations above 10,000 ppm (29 percent of bright-colored paints).

This study included 11 white paints, 9 yellow paints, and 8 red paints. Yellow and red paints contained the highest total lead concentrations.

Seven out of 9 yellow paints (78 percent of yellow paints) contained lead concentrations above 90 ppm, 4 paints of which exceeded more than 10,000 ppm of lead (44 percent of yellow paints).

Six out of 8 red paints (75 percent of red paints) contained lead concentrations above 90 ppm, one paint of which exceeded more than 10,000 ppm (12 percent of red paints).

3.5 LABELING

In general, most paint can labels did not carry meaningful information about lead content or the hazards of lead paint.

All paints did not provide information about lead on their labels and most paint can labels carried little information about any ingredients. Most paints were merely labeled as “solvents, pigments and resin,” with no further details on the type of solvents and pigments (organic or inorganic) provided on paint can labels. Manufacturing dates were present in all paint can labels, while batch numbers were included on the labels of 24 out of 28 paints (86 percent of paints) included in this study. Most warning symbols on the paint cans indicated the flammability of the paints, while other warnings included “Harmful for water resources,” “Avoid discharge in environment,” “Irritant,” and “Keep away out of reach of children,” but no precautionary warnings on the effects of lead dust to children and pregnant women were provided.

4. CONCLUSIONS AND RECOMMENDATIONS

This study demonstrates that solvent-based paints for home use with high concentrations of lead are widely available in Moldova since the paints sampled for this study are brands commonly sold in retail stores all over the country. However, the fact that 12 out of 28 paints (43 percent of paints) contained lead concentrations below 90 ppm indicates that the technology to produce paints without added lead exists in Moldova, and can be imported into the country from nearby regions. The study results provide a strong justification to adopt and enforce a regulation that will ban the manufacture, import, export, distribution, sale and use of paints with total lead concentrations greater than 90 ppm.

To address the problem of lead in paint, the Public Association EcoContact and IPEN propose the following recommendations:

For the Government of Moldova (Ministry of Environment, Ministry of Health, Ministry of regional development and Constructions) to immediately enforce the legislation that will ban the manufacture, import, export, distribution, sale and use of lead paints, i.e. paints that contain total lead concentrations exceeding 90 ppm, the most restrictive standard in the world. They should also require paint companies or importers to display sufficient information indicating toxic content on paint can labels and provide a warning on possible lead dust hazards when distributing painted surfaces.

For paint companies that still produce lead paints to expeditiously stop the use of leaded paint ingredients in paint formulations. Paint companies that have shifted to non-lead paint production should get their products certified through independent, third party verification procedures to increase the customer's ability to choose paints with no added lead. For companies which import paints to Moldova to stop to import paints containing lead.

For paint consumers to demand paints with no added lead from paint manufacturers, as well as full disclosure of a paint product's lead content. Household and institutional consumers should ask for, consciously buy, and apply only paints with no added lead in places frequently used by children such as homes, schools, day care centers, parks and playgrounds.

For public health groups, consumer organizations and other concerned entities to support the elimination of lead paint, and conduct activities to inform and protect children from lead exposure through lead paint, lead in dust and soil, and other sources of lead.

For NGOs to conduct awareness and information campaigns to inform the consumers about the danger of lead in paints.

For all stakeholders to come together and unite in promoting a strong policy that will eliminate lead paint in Moldova.

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Other information used in this study were taken from these websites:

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<http://www.bicomplex.md/materiale-de-constructii-finisare-amestec-uscat-adeziv-fuga-chisinau-pret/vopsele-lacuri-emali-pret-moldova-chisinau.html?p=6>
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APPENDIX

TABLE 4. SOLVENT-BASED PAINTS FOR HOME USE INCLUDED IN THE STUDY

Sample No.	Brand	Color*	Volume	Price (Currency)	Date of Manufacture (y/m/d)	Batch No.	Date of Purchase (y/m/d)	Is there website on label?
MOL-1	Rastsvet, Empils	W	0.9 kg	65 MDL	03.2016	947/2	15.07.2016	yes
MOL-2	Rastsvet, Empils	Y	0.9 kg	88 MDL	03.2016	996/1	15.07.2016	yes
MOL-3	Rastsvet, Empils	R	0.9 kg	88 MDL	03.2016	1005/3	15.07.2016	yes
MOL-4	Sniezka	W	0.7 L	80 MDL	29.10.2015	257766	19.07.2016	yes
MOL-5	Sniezka	R	0.7 L	79 MDL	11.02.2016	258241	19.07.2016	yes
MOL-6	Sniezka	Y	0.7 L	79 MDL	23.02.2016	258380	19.07.2016	yes
MOL-7	Dali, Rogneda	W	0.75 L	164 MDL	14.03.2016	0017	15.07.2016	yes
MOL-8	Dali, Rogneda	y	0.75 L	164 MDL	14.08.2015	0118	15.07.2016	yes
MOL-9	Dali, Rogneda	R	0.75 L	164 MDL	18.06.2015	0082	15.07.2016	yes
MOL-10	Leko, Orgachim	W	0.65 L	127 MDL	05.06.2015	None	15.07.2016	yes
MOL-11	Leko, Orgachim	Y	0.65 L	127 MDL	03.07.2014	None	15.07.2016	yes
MOL-12	Leko, Orgachim	R	0.65 L	115 MDL	18.06.2014	None	15.07.2016	yes
MOL-13	Paritet, Rolax	W	0.9 kg	60 MDL	10.08.2015	None	15.07.2016	yes
MOL-14	Paritet, Rolax	Y	0.9 kg	70 MDL	11.01.2016	6050248	15.07.2016	yes

Sample No.	Brand	Color*	Volume	Price (Currency)	Date of Manufac- ture (y/m/d)	Batch No.	Date of Purchase (y/m/d)	Is there website on label?
MOL-15	Paritet, Rolax	R	0.9 kg	70 MDL	11.01.2016	6020227	15.07.2016	yes
MOL-16	Si Belle, Ninachim	W	0.9 kg	55 MDL	13.04.2016	3/2	15.07.2016	yes
MOL-17	Si Belle, Ninachim	Y	0.9 kg	61 MDL	05.2015	1	15.07.2016	yes
MOL-18	Si Belle, Ninachim	R	0.9 kg	61 MDL	14.05.2015	43	15.07.2016	yes
MOL-19	Enamel, Khimrezerv	W	0.9 kg	53 MDL	22.09.2015	135	15.07.2016	yes
MOL-20	Enamel, Khimrezerv	Y	0.9 kg	58 MDL	17.02.2016	7	15.07.2016	yes
MOL-21	Enamel, Khimrezerv	R	0.9 kg	52 MDL	13.02.2016	6	15.07.2016	yes
MOL-22	Palitra, Cheton Group	W	0.8 kg	45 MDL	12.06.2016	298	18.07.2016	yes
MOL-23	Palitra, Cheton Group	Y	0.8 kg	45 MDL	12.11.2015	904	18.07.2016	yes
MOL-24	Palitra, Cheton Group	R	0.8 kg	45 MDL	03.05.2016	240	18.07.2016	yes
MOL-25	Harmony, Tikkurila	W	0.9 L	260 MDL	Valid till 17.12.2018	7657873	15.07.2016	yes
MOL-26	Zebra, ZIP	W	0.9 kg	45 MDL	07.04.2016	593	18.07.2016	yes
MOL-27	DekArt	W	9.0 kg	45 MDL	04.2016	81	18.07.2016	yes
MOL-29	Aur-M, Supraten	Y (gold)	0.2 L	87 MDL	04.05.2016	3	09.08.2016	yes

* W - white, R - red, Y - yellow, G - green.

TABLE 5. RESULTS OF LABORATORY ANALYSIS OF SOLVENT-BASED PAINTS FOR HOME USE

Sample No.	Brand	Color	Lead Content, Dry Weight (ppm)	Country of Brand Headquarters	Country of Manufacture	Is there information on can about lead content of paint?
MOL-1	Rastsvet, Empils	W	1,400	Russia, Rostov-on-Don	Russia	No
MOL-2	Rastsvet, Empils	Y	930	Russia, Rostov-on-Don	Russia	No
MOL-3	Rastsvet, Empils	R	1,000	Russia, Rostov-on-Don	Russia	No
MOL-4	Sniezka	W	<60	Poland	Poland	No
MOL-5	Sniezka	R	<60	Poland	Poland	No
MOL-6	Sniezka	Y	<60	Poland	Poland	No
MOL-7	Dali, Rogneda	W	160	Russia	Russia	No
MOL-8	Dali, Rogneda	y	100	Russia	Russia	No
MOL-9	Dali, Rogneda	R	<60	Russia	Russia	No
MOL-10	Leko, Orgachim	W	<60	Bulgaria	Bulgaria	No
MOL-11	Leko, Orgachim	Y	410	Bulgaria	Bulgaria	No
MOL-12	Leko, Orgachim	R	200	Bulgaria	Bulgaria	No
MOL-13	Paritet, Rolax	W	<60	Ukraine	Ukraine	No
MOL-14	Paritet, Rolax	Y	14,000	Ukraine	Ukraine	No
MOL-15	Paritet, Rolax	R	6,300	Ukraine	Ukraine	No

Sample No.	Brand	Color	Lead Content, Dry Weight (ppm)	Country of Brand Headquarters	Country of Manufacture	Is there information on can about lead content of paint?
MOL-16	Si Belle, Ninachim	W	<60	Bulgaria	Bulgaria	No
MOL-17	Si Belle, Ninachim	Y	35,000	Bulgaria	Bulgaria	No
MOL-18	Si Belle, Ninachim	R	83,000	Bulgaria	Bulgaria	No
MOL-19	Enamel, Khim-rezerv	W	<60	Ukraine	Ukraine	No
MOL-20	Enamel, Khim-rezerv	Y	23,000	Ukraine	Ukraine	No
MOL-21	Enamel, Khim-rezerv	R	300	Ukraine	Ukraine	No
MOL-22	Palitra, Cheton Group	W	1,500	Moldova	Moldova	No
MOL-23	Palitra, Cheton Group	Y	16,000	Moldova	Moldova	No
MOL-24	Palitra, Cheton Group	R	490	Moldova	Moldova	No
MOL-25	Harmony, Tik-kurila	W	<60	Finland	Finland	No
MOL-26	Zebra, ZIP	W	<60	Ukraine	Ukraine	No
MOL-27	DekArt	W	<60	Ukraine	Ukraine	No
MOL-29	Aur-M, Supraten	Y (gold)	<60	Moldova	Moldova	No

* W - white, R - red, Y - yellow, G - green.

TABLE 6. DISTRIBUTION OF LEAD CONCENTRATION BY BRAND

Brand	No. of Samples	No. of Samples Above 90 ppm	No. of Samples Above 10,000 ppm	Minimum Lead Content (ppm)	Maximum Lead Content (ppm)
Rastsvet, Empils	3	3	0	930	1,400
Sniezka	3	0	0	<60	<60
Dali, Rogneda	3	2	0	<60	160
Leko, Orgachim	3	2	0	<60	410
Paritet, Rolax	3	2	1	<60	14,000
Si Belle, Ninachim	3	2	2	<60	83,000
Enamel, Khimrezerv	3	2	1	<60	23,000
Palitra, Cheton Group	3	3	1	490	16,000
Harmony, Tikkurila	1	0	0	<60	<60
Zebra, ZIP	1	0	0	<60	<60
DekArt	1	0	0	<60	<60
Aur-M, Supraten	1	0	0	<60	<60

TABLE 7. DISTRIBUTION OF LEAD CONCENTRATION BY COLOR

Color	No. of Samples	No. of Samples Above 90 ppm	No. of Samples Above 10,000 ppm	Minimum Lead Content (ppm)	Maximum Lead Content (ppm)
White	11	3	0	<60	1,500
Yellow	9	7	4	<60	35,000
Red	8	6	1	<60	83,000



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