

PROMOTING REGULATORY AND VOLUNTARY
ACTION BY GOVERNMENT AND INDUSTRY TO
PHASE OUT LEAD IN PAINT

NATIONAL BASELINE INFORMATION ON LEAD PAINT IN JORDAN

April 2020

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1 Background

Lead is a cumulative toxicant particularly harmful to young children and pregnant women. The cost of reduced cognitive potentials (loss of IQ points) due to preventable childhood lead exposure in low and middle-income countries is estimated as \$977 billion annually. The Institute for Health Metrics and Evaluation (IHME) has estimated that in 2015 lead exposure accounted for 494,550 deaths due to long-term effects on health, with the highest burden in low and middle-income countries. IHME also estimated that lead exposure accounted for 12.4% of the global burden of idiopathic intellectual disability, 2.5% of the global burden of ischaemic heart disease and 2.4% of the global burden of stroke. Lead in paint is a major source of childhood lead exposure.¹ 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.² 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. <https://ipen.org/projects/eliminating-lead-paint/ipen-research>

2 Introduction:

Industry in Jordan is one of the important and major sectors, and is the first component and supporter of the national economy, the industrial sector in Jordan contributes directly to the process of economic growth in it, through its absorption of local labor in addition to supporting the balance of payments by increasing government revenues by The tax balance, in addition, is moving many other sectors and participating in supporting the rotation of economic growth forward.

This report provides information about local paint market production and consumption, and quantities of import and export of paint from relevant national authorities, chambers of industry, chambers of commerce and manufacturers of paint. In addition, the result of randomly selected paint testing samples from local market to analyze lead content in samples. Results show some violated paint samples that exceed the lead content of 90 ppm.

3 Administrative Framework

Following are the outlines of the existing environmental legislations related to paint; this includes the Jordanian laws, by-laws, regulations and standards:

3.1 National Institutional Framework and Mandate

Ministry of Environment (MoEnv)

Ministry of Environment (MoEnv) was established in 2003 to replace administratively the General Corporation for Environment Protection.

Environmental Protection Law (No. 6, 2017) is the reference law which organizes MoEnv activities. The law aims at protecting all environmental components.

The project should comply with Article (4) of this law, which is related to the necessity of preserving the environmental components including atmosphere, water, soil and the natural living beings.

The MoEnv had issued The Management, Transport and Handling of Harmful and Hazardous Substances Regulations. (No. 24, 2005) which includes clauses for the production, storage, import, use, sales and transporting of hazardous chemicals,

MoEnv has also a mandate to inspect, audit and monitor the compliance with the set standards and regulations.

Ministry of Health (MoH)

The Ministry of Health is represented by Health Directorates in the Governorates, which have the responsibility to follow up health matters in industries as well as the public health.

The Environmental Health Directorate has also the responsibility to check on the compliance of all industries with the health protection requirement. Disease Prevention and Safety Directorate and Occupational Health Division conduct periodical inspection programs on all industries in Jordan.

The objective of the Chemical Safety Department in the Environmental Health Directorate is to protect public health from the negative impacts resulting from handling chemicals throughout the whole process (importation, transportation, storage, and end use).

Ministry of industry and trade / JSMO:

The Jordan Standards and Metrology Organization (JSMO) were established as a public Organization with financial and administrative autonomy in accordance with the Standards and Metrology Law No. 15 for the Year 1994, amended in accordance with the Law No. 22 for the Year 2000 and its amendments. Prior to that, the Organization had been one of the directorates in the Ministry of Industry and Trade. JSMO have the responsibilities to adopt the national system for standardization and metrology based on accepted international practices. to Keep pace with scientific and technical developments in the fields of standards, metrology, conformity assessment and laboratory accreditation and Ensuring the health and safety of the Kingdom's citizenry and protection of the environment by making sure those goods, products and services are in compliance with the technical regulations adopted by the Organization for the purpose.

4 Environmental Legislations

4.1 National legislations

The following table shows the national legislations related to lead in paint laws.

Table (4.1): Legislations related to the proposed project.

No.	Legislations	No.	Year	Issues
1.	Laws			
A.	Environmental Protection Law.	6	2017	The project should comply with Article (4) of this law, which is related to the necessity of preserving the environmental components including atmosphere, water, soil and the natural living beings.
B.	Public Health Law	47	2008	This law states that, under the penalty of the law, it is not allowed to cause or be the cause of any hygiene mishap, which includes a special chapter for chemical materials.
2.	Regulation			
A.	Management, Transport and Handling of Harmful and Hazardous Substances Regulations.	24	2005	Article (2) gives a definition of hazardous and harmful substances. Articles (3) to (6) specify obligation of the committee formulated by this regulation to license entities to use harmful substances. Article (7) states obligations of licensed entity in dealing with hazardous substances.

No.	Legislations	No.	Year	Issues
B.	Import regulation No (109) year 2015			Article (6) defines the chemicals list that are considered prohibited or restricted by the legislation of the Ministry of Environment and whose import requires the approval of the Ministry of Environment.

4.2 Paint Standards

The following table shows the Jordanian standard related to paint industries:

Table (4.2): paint industry standards.

No	JS-ID	Year	Description	Legal
1	433-20	2001	paint filling material - smoked silica	voluntary
2	433-11	2001	paint filling material - natural talk as flaks contain carbonate	voluntary
3	433-13	2001	paint filling material natural quartz	voluntary
4	433-5	2001	paint filling material - crystalized natural calcium carbonate	voluntary
5	253	2003	specifications for oil base paint of alkyd base- except fast drying paints	compulsory
6	1149	2003	paint nitrocellulose base It is concerned with the nitrocellulose leveling used as a flat material or as a filler in the coating system	compulsory
7	128	2003	titanium dioxide pigment testing	compulsory
8	1006	2004	Zinc phosphate pigment testing	compulsory

No	JS-ID	Year	Description	Legal
9	433-6	2001	paint filling material -precipitated calcium carbonate	voluntary
10	433-22	2001	paint filling material	voluntary
11	933	1993	liquor paint used by spraying for general purposes	voluntary
12	433-21	2001	paint filling material -silica	voluntary
13	571	2006	mineral solvent white spirit - prepared to be used in paints and hydrocarbon solvents	compulsory
14	545	2005	Testing of road marking paints on asphalt and concrete surfaces	compulsory
15	464	2006	Flaxseed oil used in paints	compulsory
16	132	2006	paint dryers- solid and liquid phase	compulsory
17	808	1991	heat resistant paint - used to cover surfaces exposed to high temperature as ovens	voluntary
18	474-1	2001	test paint resistance to liquids	voluntary
19	1180	1997	paint unbinding material- testing of PH value	voluntary
20	433-15	2001	paint filling material - testing silica	voluntary

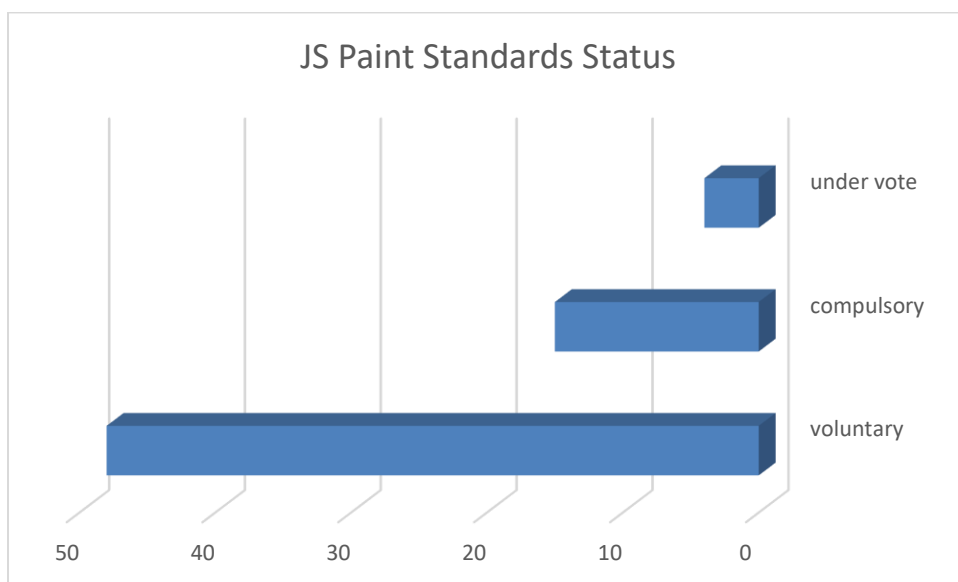
No	JS-ID	Year	Description	Legal
21	433-16	2001	paint filling material - aluminum hydroxide	voluntary
22	433-9	2001	paint filling material -roasted clay	voluntary
23	433-7	2001	Testing of dolomite	voluntary
24	433	2001	paint filling material - barium sulphate	voluntary
25	956	1993	red alkyd ferrous oxide base coat for car frame steel and iron	voluntary
26	433-19	2001	paint filling material - precipitated silica	voluntary
27	433-10	2001	paint filling material - natural talc	voluntary
28	433-8	2001	paint filling material - natural clay	voluntary
29	433-4	2001	paint filling material-pure chalk powder	voluntary
30	568-4/2000		Estimation of paint density using pressurized cup method	voluntary
31	472-2	2000	estimation of paint resistance to liquids using water submerge method under normal condition	voluntary
32	568-2	2000	estimation of paint density using submerged bodies- using of circular objects	voluntary

No	JS-ID	Year	Description	Legal
33	568-1	2000	Estimation of paint density using pycnometer for low and medium viscosity	voluntary
34	509	2000	estimation of time for surface dry using balotiny method	Voluntary
35	395	2004	solvent Cellulose paint (tenner) testing of Cellulose paint gloss and non-gloss solvent material	compulsory
36	433-17	2001	paint filling material - precipitated calcium silicate	voluntary
37	243	2004	Zinc Oxide pigment testing	voluntary
38	1176	2011	binding material testing for water paint	voluntary
39	399	2001	Testing of Cellulose paint- for cars- testing method sampling and information page card statement	voluntary
40	492	2010	Determination of non-volatile content	voluntary
41	433-14	2001	paint filling material - Crystobalate properties and testing method	voluntary
42	433-12	2001	paint filling material -white mica	voluntary
43	568-3	2000	Estimation of paint density using vibration method	voluntary

No	JS-ID	Year	Description	Legal
44	16	2002	testing of water base paint (emulsion)	voluntary
45	433-1	2001	paint filling material - general testing method	voluntary
46	433-18	2001	paint filling material - precipitated sodium and aluminum silicate	voluntary
47	930	2006	Spirit of turpentine	NA
48	700	2000	sampling method for paint - liquid or powder	voluntary
49	433-11	2010	paint filling material natural talc as flakes contain carbonate	under vote
50	1174-1	2011	binding material alkyd resins	voluntary
51	1877-2	2008	paste for internal surface- paste with organic solvent	under vote
52	244	2010	alkyd semi-gloss paint - dried by air	NA
53	1877	2011	paste of water base for internal surface - except surfaces submerged in water	under vote
54	1139	2010	properties of semi-gloss alkyd paint that dry by air and used as final cover for concrete , wood and metal surfaces	compulsory
55	1868-1	2008	Thermoplastics used for road signs Thermoplastics	voluntary

No	JS-ID	Year	Description	Legal
56	1175	2011	Examination of the sustainable combustion of liquids sustainable combustion of liquids test	voluntary
57	1036	2010	Alkyd-based lining paints	compulsory
58	1197-1	2010	paint binding material - softening point using ring ball method	voluntary
59	1035	2010	matte paint of alkyd base for internal and external use	compulsory
60	1868-2	2008	The thermoplastic materials used are heated for road signs- part 2 application method	voluntary
61	31	2010	water base paint - emulsion	compulsory
62	989	2012	synthetic resin emulsion paint	compulsory
63	2171	2018	paint and varnish - Terms and definitions	compulsory
64	2212	2019	Environmentally friendly construction products - paints, varnishes, paints and sealants	under vote
65	31	2019	water base paint - emulsion	voluntary
66	2217-1	2018	Volatile organic compound - difference calculation method	voluntary

No	JS-ID	Year	Description	Legal
67	2217-2	2018	volatile organic compounds natural content - GC method	voluntary
68	1181	1997	paint binding material - saponification value by quantitative detection method	voluntary
69	1177	1997	Paints and varnishes - Binders - Quantification of free formaldehyde for amino resin content - Sodium sulfate method	voluntary



4.3 Banned Chemicals from importing and trading

Table (4.3) shows the list of banned chemicals from importing and trading in Jordan.

Table (4.3) List of Chemicals that are banned from importing and trading in Jordan for health reasons.

No.	Material Name	CAS No.	Conditions
1.	Lead carbonates: Neutral anhydrous lead carbonate (PbCO_3). Trilead-bis(carbonate)-dihydroxide ($2\text{PbCO}_3 \cdot \text{Pb}(\text{OH})_2$)	598-63-0 1319-46-6	It is prohibited to use them as materials or as part of material for the manufacture of all paints kinds, except for paints used in the maintenance and rehabilitation of historic buildings and works of art and related internal works after obtaining necessary approvals
2.	Lead Sulphates: Lead Sulphate (PbSO_4) (b) Lead Sulphate (Pb_xSO_4)	 7446-14-2 15739-80-7	
3.	Lead and its compounds: With the exception of those specified elsewhere in this LIST. Examples of Common lead Compounds	=====	It shall not be used as materials or as part of the materials intended to be used in the manufacture of household paints, so that the lead content in the household paints intentionally or unintentionally shall not exceed (0.06% (600 mg / kg) of the total mass of the paint, except for the paint Used in the maintenance and rehabilitation of historical buildings and technical works and related internal works after taking the necessary approvals. It shall not be used in packaging materials by adding them directly or intentionally as part of the process of manufacturing, forming, distribution or printing.
	Lead	7439-92-1	
	Lead Acetate	301-04-2	
	Lead (II) Acetate, trihydrate	6080-56-4	

No.	Material Name	CAS No.	Conditions
	Lead Phosphate	7446-27-7	The total concentrations of the following heavy metals (hexagonal chromium, cadmium, lead and mercury) contained in packaging materials intentionally or unintentionally exceed 100 ppm (100 mg / kg) (0.01% by weight).
	Lead Selenide	12069-00-0	
	Lead Hydrogen Arsenate	7784-40-9	
	Lead Hexafluorosilicate	25808-74-6	
	Lead Alkyls	=====	
	Lead Azide	13424-46-9	
	Lead Acetate	1335-32-6	
	Lead(II) methanesulphonate	17570-76-2	
	Lead 2,4,6-trinitroresorcinoxide, Lead styphnate	15245-44-0	
	Lead Chromate	7758-97-6	
	C.I. Pigment Yellow 34 Lead sulfochromate yellow (This substance is identified in the Colour Index by Colour Index Constitution Number, C.I. 77603)	1344-37-2	
	C.I. Pigment Red 104; Lead chromate molybdatesulphate red (This substance is identified in the Colour Index by Colour Index Constitution Number (C.I. 77605)	12656-85-8	
	Tetra ethyl lead	78-00-2	Only used in laboratories and research centers.

13	Tetra methyl lead	75-74-1	
	Benzoic acid,5-[[4-[(2-amino-8-hydroxy-6-sulfo-1-naphthalenyl)azo][1,1-biphenyl]-4-yl]azo]-2-hydroxy-,disodium salt / C.I. Direct Red 1	2429-84-7	
	Benzoic acid,5-[[4-[(2,4-diamino-5-[[4-sulfophenyl)azo]phenyl]azo]-[1,1-biphenyl]-4-yl]azo]-2-hydroxy-,disodium salt / C.I. Direct Brown 1	3811-71-0	
	2,7-Naphthalenedisulfonic acid, 4-amino-5-hydroxy-6-[[4-[(4-hydroxyphenyl)azo][1,1-biphenyl]-4-yl]azo]-3-(4-nitrophenyl)azo]-,disodium salt / C.I. Direct Green 6	4335-09-5	
	2,7-Naphthalenedisulfonic acid, 4-amino-5-hydroxy-3-[[4-[[4-hydroxy-2-[[2-methylphenyl) amino]phenyl]azo][1,1-biphenyl]-4-yl]azo]-6-[(4-sulfophenyl)azo] ,trisodium salt / C.I. Acid Black 94	6358-80-1	
	Benzoic acid,5-[[4-[[4-[(4-amino-7-sulfo-1-naphthalenyl)azo]-6-sulfo-1 naphthalenyl] azo]-[1,1-biphenyl]-4-yl]azo]-2-hydroxy-, trisodium salt / C.I. Direct Brown 27	6360-29-8	
	Benzoic acid,5-[[4-[(2,6-diamino-3-methyl-5-[(4-sulfophenyl) azo]phenyl]azo)-[1,1-biphenyl]-4-yl]azo]-2-hydroxy-3-methyl-,disodium salt / C.I. Direct Brown 154	6360-54-9	
	Benzoic acid,3,3-[(3,7-disulfo-1,5-naphthalenediyl)bis[azo(6-hydroxy-3,1-phenylene)azo[6(or 7)-sulfo-4,1-HYDROGENnaphthalendiyl]azo[1,1-biphenyl]-4,4-diylazo]]bis[6-hydroxy-,hexasodium salt / C.I. Direct Brown74	8014-91-3	
	Cuprate(2-),[5-[[4-[[2,6-dihydroxy-3-[(2-hydroxy-5-sulfophenyl)azo]phenyl]azo][1,1-biphenyl]-4-yl]azo]-2-hydroxybenzoate(4-)]-,disodium / C.I. Direct Brown 95	16071-86-6	

5 Paint Market in Jordan:

In Jordan there are 77 paints industries producing all types of paints (i.e. car refinish, coil coating, powder, etc.) and most of the companies considered SME's. there are no statistics for paint retailers in Jordan as only few retailers are specialized in paint only most of them are selling construction materials in general. For paint importers, many companies have dual licenses to import paint and other chemical but they did not provide data on their import.

The following table shows the data from custom regarding the quantities of the imported pigments and dryers:

Table (5.1): Imported Pigments and Dryers for 2019

Chemical/HS code	Quantity (kg)
PIGMENTS	
Lead chromate molybdate sulphate red (PbCrO ₄ (CrH ₂ O ₄ .Pb) / 2841.50	69.41
Lead chromate (PbCrO ₄)/ 2841.50	
Lead tetra oxide - minimum (Pb ₃ O ₄) / 2824.90	non
Lead monoxide (PbO) /2824.10	non
White lead (2PbCO ₃ ×Pb(OH) ₂) 2836.99	1631950.59
DRIERS	
Lead octoate (/C ₁₆ H ₃₀ O ₄ Pb) 3211.00	210994
Lead naphthenate (C ₂₂ H ₁₄ O ₄ Pb) / 3824.999	4344771.837

In Jordan the Production price of paints, varnishes, coatings and printing inks in the year 2017 was 274,830,000 JD (387635347.65 USD), and the quantity of imported materials for paints, varnishes, coatings and printing inks industries was in the year 2017, 30,767,981 Kg which is equivalent to 59,402,226 JD (83,784,166 USD), The following table shows the paint manufacturer in Jordan.

Table (5.2): paint Manufacturer in Jordan:

no	Company name	Phone number	Email address
1	Industrial commercial agricultural – al intaj	026234586	icacontactus@ICA-JO.COM
2	Jordan English Paints Co.	064141210;064141211	jep@orange.jo
3	Musa Aref Ibrahim Kilani	064894248	N.A
4	Fathi Abu Arja	064022659	N.A
5	Arab Group For Chemical Products AGROUP	064895273;064887886	agroup@go.com.jo
6	National Paint	064790790	npfc@nationalpaints.com
7	Radwan Abdo Ahmed Al Halabi	064022499	N.A
8	United Chemicals Co Unichem	064203366	info@unichemgroup.com
9	Jordan Sipes Paints Co	064201292	info@sipes.jo
10	jimstone company	064783072	N.A
11	Modern Paint	064204022	N.A
12	Jordan, Swedish Polymers Industrial Co. - TERRACO	064711650	info@terraco.jo
13	Abdul Malek Ahmed Abdul Qader Al Nubani	064161660;065828487	N.A
14	International Specialized Paints Co Solo	064026633	solocoat@hotmail.com
15	Khaled Abu Dreea & Partners	064160143	N.A
16	muhamad bilbul		toppaints@hotmail.com
17	Musa Ahmed Mohammed Rashid and Co.	061488096	mousarashid@yahoo.com
18	Fosroc Jordan	064022665	infojordan@fosroc.com
19	Mohammed Nofal	064026722	TARIQ_NOFAL@YAHOO.COM
20	Al Quds Paints Industry Co	064029023;064029023	info@qudspaints.com
21	Modern Paints & Chemical Industries - Dulux	064711011	maher@mpci.com.jo
23	TAPCO Paints	064026502	tapcopaints@al_khayatgroup.com
24	Fouad Sherif Dawood Salama	064202515	salameh@american_paints.com

no	Company name	Phone number	Email address
25	muhamad ebdalhmyd saed muhamad		english_paints@yahoo.com
26	Dimlaj Industrial Group LLC	064204002	fares.abuawwad@dimlaj.com
27	Achievements for construction chemicals		ziadmitani@hotmail.com
28	Friendly Chemicals Industrial & Commercial Co.	064051410;064051410	globalpaints@sama.jo
29	New for Industrial & Commercial Chemicals	065066646;065058835	INFO@GENERATIONCHEMICALS.COM;NEW- CHEM@NETS.COM.JO
30	Technical Paints & Putties Industrial Co.	064020056	dylon_paints@yahoo.com;mohanad.73@hotmail.c om
31	Abdel Naser Al-Neser & Co. - Future Paints Factories Co.	064020457	eng.wailfaied@futurepaintsco.com
32	Universal Paints	064884454;053611624;06488445 9	info@ugc.jo
33	International Polymerization & Carbonate Company LLC		GLOBAL.POLYMER@yahoo.com
34	Nova Paint	064022420	nova_paint@yahoo.com;nova_paint.ahlam@hotm ail.com
35	Ziad Hussein Shaaban Abdel Aziz		N.A
36	reema lux	064790790	N.A
37	Haidan Coating Technology	065855375	robert.srouji@srujigroup.com
38	Awad and Rashad Abou El Sheikh	064888542	rashad@tameerpaints.com
39	Ammar Yousef Mohammed Abuheiba		paints@abuhaibeh.com
40	Vision For Petrochemical Industries		visionpetochemical@gmail.com
41	Fathallah and Orabi	066789240	N.A
42	Raghadan Paints	065301000	info@raghadanpaints.com.jo;AHMED_GHD82@Y AHOOCOM
43	Advanced Glass Industries	064892244	ahmad.salam@yahoo.com
44	Jordanian for German Paints Technology	053551673	JEC_PAINTS@HOTMAIL.COM
45	Tayseer Mustafa Mahmoud Halawani	065862548	RAWAJCORP@GMAIL.COM
46	International calcium carbonate industry	065521133	INFO@GCCJO.COM

no	Company name	Phone number	Email address
47	Ramzi Al Shanoudi Paints Factory		ramzianton@hotmail.com
48	Gulf Paints		info@gulfpaints.net
49	Anwar Aleppo Wooden Furniture Industry		agrabawe@hotmail.com
50	Applied Paints Co	064025009	ODAI.ABBAS@HOTMAIL.com
51	Jana For Paints	065599667	N.A
52	Laith Samir Mikhail Hijazin		dong-io20@hotmail.com
53	Alaraqa Paint Industry		MR.R.01@HOTMAIL.COM
54	ECO GREEN FOR CONSTRUCTION CHEMICALS LLC	062008863	NASER.AS@WINDOWSLIVE.COM
55	HORIZON PAINTS.CO	006403737	raed@horizanpaints.com
56	Ghassan Saad Eddin Mohammed Fares	065602273	GHASSANEST@YAHOO.COM
57	golden knight factory	065602273	GHASSANEST@YAHOO.COM
58	Musab Ghazi Mohammed Abu Samah	065681670	mosab7o@gmail.com
59	Argun Industrial Trading		
60	Orbit Aluminum Industry	032031353	mdaaboul@orditalu.com
61	Color Gate		MAJEED.SAMAN@GMALI.COM
63	wafa chemicals Jordan	065855567	waleed_export@ecatchchemicals.com
64	Awni, Bilal Natour and Zuhair Aladdin		belal.alnatovr@hotmail.com
65	European Jordan Paint		lafimohammed66@gmail.com
66	NSR for paint industry		rustom_a@yahoo.com
67	zain center for paint and docoration		abbasalalabbas612@yahoo.com
68	masriki walbawab		RAMI_MASREKI@HOTMAIL.COM
69	Waleed Hanafy & Mahmoud Salamah Company		N.A
70	Salah Wahdan Heating Incinerato		N.A
71	Shawki Alqzaa for furniture paint		N.A
72	Crystal for painting		N.A
73	Ammar Asaad Mahmoud Abdel Karim		N.A

no	Company name	Phone number	Email address
74	First Technology for Hybrid and Electric Cars	065733114	N.A
75	taqseem for the manufacture of gypsum boards		gani.girici@gmail.com
76	Potensa Company for Chemical Industries	064029910	INFO@POTENZA.CO.COM
77	PURANO Paints & Decoration Accessories	064166003	N.A

5.1 Paint importers and Exporters in Jordan

Due to the limited size of the Jordan market, Jordanian paint companies, especially those categorized as upper medium in terms of size reply mostly on export to sustain their business. Normally, Iraq and the Arabian Gulf countries are the main external market. The following table shows main exported according to Ministry of industry and trade files.

Table (5.3): paint exporter in Jordan

No	Company Name	Paint type
1	AlQuds Paints Industry Co	Gemstone paints
2	Jordan Sipes Paints Co	Emulsion
3	European Jordan paints	Water-based paints
4	Color Gate Company for the manufacture of paints and pastes	oil paints
5	Horizon Paints Co.	oil paints
6	Jordanian for German Paints Technology	Emulsion
7	Modern Paints & Chemical Industries - Dulux	Water-based paints, oil base
8	ECO GREEN FOR CONSTRUCTION CHEMICALS LLC	Water-based paints
9	Fouad Sharif Dawood Salama	Water-based paints
10	TAPCO Paints	Emulsion, Pastes, walls and construction
11	Al Sada For Paints Industry Co	oil base, emulsion
12	Mohamed Abdel Hamid Saad Mohamed	oil base
13	Fosroc Jordan	Water-based paints, industrial paint
14	Awwad and Rashad Abu Al-Sheikh	Walking paints, industrial paint
15	Tayseer Mustafa Mahmoud Al-Halawani	oil base
16	Walid Hanafia and Mahmoud Salama	Water-based paints
17	Abdul Malik Ahmed Abdul Qadir Al Nubani	Emulsion
18	Jordan, Swedish Polymers Industrial Co. (Terraco)	Emulsion
19	Reema lux	Emulsion , industrial paint
20	Jordan English Paints Co.	oil base
21	Universal Paints	Industrial paint
22	Middle East and North Africa for the manufacture of paints	Emulsion
23	National paint	Industrial paint
24	Nova Paint	Industrial paint
25	Near East Petrochemicals Co	Industrial paint
26	United Chemical Company Ltd. (UNICHEM)	Industrial paint
27	Orbit Aluminum Industries	Industrial paint
28	Haidan Coating Technology	Industrial paint

Additionally, as Jordan follows open market rules, different types of paints are imported to the Jordanian market. The following table shows the main importers according to Ministry of industry and trade

Table (5.4): Main paint importers in Jordan

No.	Name
1.	HEIRS OF NICOLAS SAMI SABANEH CO. LTD
2.	ZAKARIA ALI HASAB MUSTAFA
3.	ALMAHMOUDIA VEHICLES TRADING CO. LTD
4.	AHMAD & MOHAMMAD ABU ALSOUD CO
5.	ALSOUS & KHALAF AND ISEID CO.
6.	FRIEND TRADING PAINTS CO. LTD
7.	TALAL KHALED MOH'D ALNATSHEH
8.	WALLAS AND PAINTS FOR FINISHES AND DECORATION CO. LTD
9.	BASEM ABDELJALIL MARAI ABU MAZEN
10.	RANA SHUKRI HAYDAR ABUSARA
11.	IBRAHIM MAJED ALI AND PARTNERS CO.
12.	AYAT FATHI MOHAMED ALJAZARAH
13.	ESAM YOUSIF ABD AL LATIF AL HINAWI
14.	BAYDR AL KHAIR FOR PAINTS TRADING COMPNAY LIMITED
15.	ATHWAQ NAPULI FOR PAINTS AND DECORATION LIMITED COMPANY
16.	RITAL FOR FINISHIN, PAINTS AND DECORATION WORKS COMPANY LIMITED
17.	FIRAS KHALID ABDELKAREEM ALKHOULI
18.	WINGS FOR INDUSTRIAL COATING CO. LTD
19.	AMIR REZK AND PARTNER CO
20.	ZEYAD AHMED ABDULQADER ABU BAKER
21.	SMART SOLUTIONS TRADE PAINTS AND ISOLATIONS CO.LTD
22.	LAND PARADISES FOR PAINTS DISTRIBUTION AND SUPPLIES.CO.LTD.
23.	AMER MAHMOUD ABDULLAH ISMAEL
24.	GOLDEN RAYS FOR CAR PAINT CO.LTD
25.	AYA ALDAHAN AND FARAJ IBRHAIM ALNASER COMPANY
26.	ZIAD ELIAS YACOUB BAQLEH
27.	IDEAL PAINTS & BUILDING MATERIALS CO.LTD.
28.	JANNAT JELFAR FOR PAINTS AND SANITARY WARES AND ELECTRICAL COMPANY LIMITED
29.	KHALED DAWOD ASAD AMARH
30.	ALFARID PEARL FOR PAINTS CO. LTD.

No.	Name
31.	SARAYA AMMAN FOR TRADE PAINTS CO.LTD
32.	OQLAT AND ALSARABTAH CO.
33.	YACoub ZABANEH & MILAD BAGLEH AND PARTNERS FOR PAINTS CO
34.	OSAMA DABBAH & PARTNERS CO.
35.	GHEITH & AL-HENDI CO.
36.	ROKON ALDEYAR FOR PAINT CO. LTD
37.	YOUNES ALI YOUSIF TARKHAN
38.	SAMER MOHAMMAD ABDULQADER ALNADI

For local selling of paint in Jordan it takes place through importers, local agents, manufactures local agents, paint centers and building materials shops, accordingly the small retailers number is estimated with few thousands.

6 Paint samples Collection Methodology and Results

Seventeen randomly samples were selected and analyzed at the Royal Scientific Society accredited laboratories from various stores and different brands produced by different manufacturers for the determination of lead; methods of analysis are based on Inductively Coupled Plasma (ICP) spectrometric methods. Availability of the paints in retail establishment's proof that these paints were intended to be used within home environments. The color of the sampled paint cans is important, as color reflects the use of pigments that may contain lead.

During the paint sampling and testing, information such as color, brand, manufacturer, country of origin, purchase details, product codes and production dates as provided on the label were recorded, Table (6.1) shows the collected samples information.

Table (6.1): collected samples information:

Samp le No	Trade name/Sample type	colour	Paint manufactur er/domestic, imported)	Batch No	Total Lead content in dry paint (mg/Kg)	Total Lead content total paint (mg/Kg)	comments
1	high gloss synthetic enamel oily	Red	domestic	ZYT08 0818- 2272	9.9	5.5	
2	oil glaze	light brown	domestic	18052 16	2.5	1.4	batch number and color is a removable paper sticker
3	enamel paint oily	green	domestic	18020 984	2364.4	1321.7	batch number and color and production date is a removable paper sticker sample was collected 7/2019 i.e at expire date
4	emanel gloss	off white	domestic	18003 005	52.8	19.6	data only in English
5	emulsion vinyl silk	white	domestic	no batch No	12.1	6.4	label of color and production date is removable also company name is not on the drum
6	alkyed base oily shiny	yellow	domestic	not clear	5.2	3.3	batch number , prediction and expire date not clear

Sample No	Trade name/Sample type	colour	Paint manufacturer/domestic, imported)	Batch No	Total Lead content in dry paint (mg/Kg)	Total Lead content total paint (mg/Kg)	comments
7	Beige acrylic (mix)	beige	domestic	N.A	10849	7898	Mix yellow and white
8	Yellow acrylic (mix)	beige	domestic	19041 751 yellow	5	2.2	
9	Enamel	white	domestic	19012 028	51.8	31.9	
10	Emulsion matt	Yellow	domestic	19067 05	71.2	33.3	Pavement side walk Acrylic yellow
11	Emulsion	Green – املشن خطاطين	Domestic	18024 034	Less than 1.0		Tango
12	Gloss oil base paint	yellow	Domestic	NA	15078	9378.3	
13	Base coat Iron base paint	grey	Domestic	-	243.5	165.8	
14	Roof coating	Green	Domestic		7.7	4	
15	Base red	red	Domestic	-	5.0	4.0	

Samp le No	Trade name/Sample type	colour	Paint manufactur er/domestic, imported)	Batch No	Total Lead content in dry paint (mg/Kg)	Total Lead content total paint (mg/Kg)	comments
16	Coloring die	yellow	Domestic	-	3.8	1.1	

17	Coloring die	yello w	Imported	N.A	133858	86 74 0	Egyptian product
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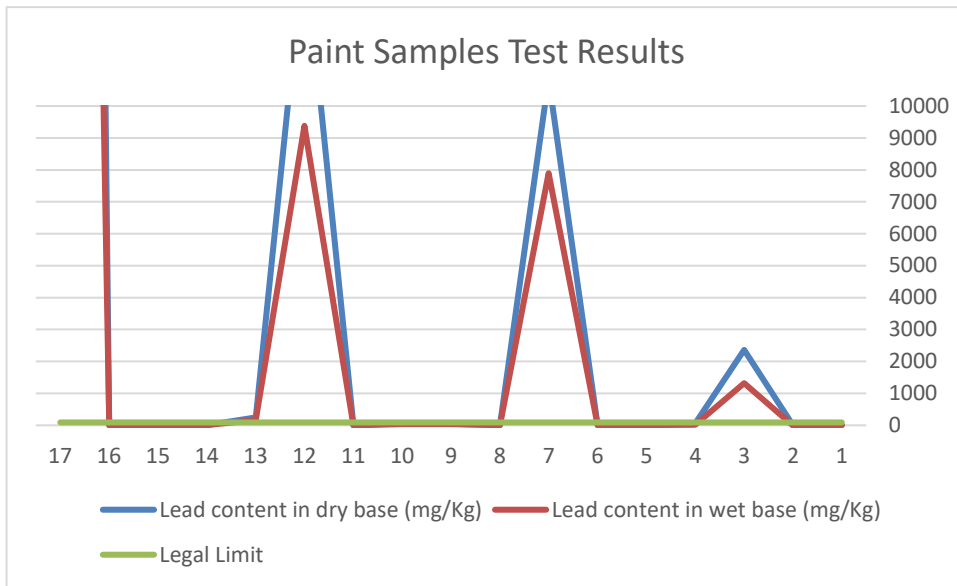


Figure (6.1) above shows that 23.5% of samples (4 samples out of 17) contained lead in concentration More than 90 ppm total lead. Three domestic paint sample and one imported sample.

7 Field Survey Remarks

- One company has a removable paper label on one of the products says it contain lead and should be used for industrial purpose only, however the retailer insist that people take this paint for home use
- One of the companies did not write its name on the paint can, instead they wrote the trade name of the product.



- Samples from one company for paints was out of date and still at retail shops
- Expired paint products from different companies are available in the local market.
- Unknown brand name paint products are available in the local market.
- Some of the paint products in the local market did not have identification label.
- Some of acrylic paint samples are taken from mixing storage (Unknown name).
- Orange paint products (oil / alkyd) are not available in the local market.

8 CONCLUSION

Lead paint is hazardous. It can cause nervous system damage, stunted growth, kidney damage, and delayed development. It is dangerous to children because they put lead chips in their mouths. Lead paint is dangerous to adults and can cause reproductive problems in men or women. Lead is considered a possible and likely carcinogen. High levels may result in death.

In Jordan there are 77 factories for the production of paints Jordan legal framework relevant to paints and coatings consists of multiple acts, regulations, rules and associated standards that must be observed concurrently in order to remain compliant, MoH issued Legislations regulating lead in paints including the Decree issued in Official Gazette No. (5503) date 01/03/2018, which states that the allowable percentage shall be reduced from 0.06% to 0.009% by weight in the household paints.

Seventeen paint samples were collected from the domestic market in Jordan, 23.5% of the collected samples contained lead in concentration more than 90 ppm total lead, consequently MoH and JSMO should increase their capacity in terms of monitoring and testing lead in paint to reduce the impact of lead exposure