OECD WORKSHOP ON LEAD PRODUCTS AND USES[1]

12-15 SEPTEMBER, 1994

TORONTO, CANADA

CHAIRMAN'S REPORT

1. The following report summarises the discussions by participants at this workshop. **<u>The statements made in this report are those of the technical experts who attended the meeting and do not necessarily represent the views of the OECD or of the governments of the Member countries.</u>**

Summary of Sessions

PLENARY SESSION (12TH SEPTEMBER, 1994)

Chairman John Buccini, from Environment Canada, opened the meeting, welcomed participants on behalf of Canada and introduced the representatives responsible for planning and organising the workshop.

Peter Victor (Assistant Deputy Minister, Ontario Ministry of Environment and Energy) welcomed workshop participants on behalf of the Government of Ontario and reported on the development of a scientific criteria document on lead and proposed standards based on the findings in the criteria document.

The Chairman continued with a brief summary of the OECD risk reduction programme. In 1990, the OECD Joint Meeting of the Chemicals Group and Management Committee selected five substances to serve as pilot chemicals for the newly created risk reduction programme. These chemicals included: lead, cadmium, mercury, methylene chloride, and brominated flame retardants. For lead, work began with the development of a status report which provided background and national experiences with reducing lead exposure. Chapters in the document focus on: production, use, exposure, national positions on risk, and national programmes to reduce such risk.

Following the publication of the status report, the Joint Meeting in May, 1993, agreed to pursue collective action on lead risk reduction with consideration of a possible Council Act on products and uses and industrial releases of lead. In November, 1993, a working group meeting developed a draft outline of a possible Council Act and an Action Programme. The development of the draft outline did not imply that a Council Act would be developed. Rather, the outline was created only to present the concepts that could be included in an Act.

At the February, 1994 Joint Meeting, Member countries continued to support the pursuit of lead risk reduction, but requested that a workshop be held to further explore the international concerns associated with lead in products.

This Toronto workshop was organised to meet these needs. Ten sessions were arranged to examine the key products and uses of lead identified at the November 1993 Working Group meeting. (The Agenda for the workshop is included as Annex 1.) The objective for each of the sessions was to address five key areas of interest: product information, route(s) of exposure, international dimensions, possible solutions, and potential implications of those solutions. These results would be provided to the second meeting of the Working Group on a Possible Council Act who would be meeting on September 15 after the conclusion of the workshop.

The charge of the workshop was to explore the technical issues surrounding lead products and uses. The Working Group meeting, after examining the policy implications of the technical conclusions of the workshop, would make a proposal for further action. This proposal would be presented to the Joint Meeting and OECD’s Pollution Prevention and Control Group (PPCG) in November.

The chairman concluded the Plenary session with a brief description of the workshop “rules of play”. Following the opening Plenary session, product specific sessions would be held over the next two and a half days. Each session would be responsible for providing a written report of their responses to the five key areas of interest. At the final Plenary session, session chairs would make oral presentations of the key findings of their respective groups and respond to questions from the audience.

The written session reports would be incorporated into the Chairman's Report of the workshop as written. The Chairman's Report will be provided to national delegations prior to the November meetings of the Joint Meeting and PPCG.

PRODUCT SPECIFIC SESSIONS

Attached as Annex 2 are the final summary reports from the 10 product specific sessions. These reports reflect the discussions held during each session, but may have been modified slightly following discussion at the concluding Plenary session. Any such changes were made by session co-chairs with the acceptance of session participants.

PLENARY SESSION (15TH SEPTEMBER 1994)

During the concluding Plenary session, oral presentations were made by the chairmen of each product/session. Questions and responses are noted in Annex 3.

The Chairman concluded the meeting by thanking the international and national organising committees, session chairs, panel members, and participants.

ANNEX 1

WORKSHOP AGENDA

	Workshop & Session	Sept 12 MONDAY		Sept 13 TUESDAY		Sept 14 WEDNESDAY		Sept 15 THURSDAY	
		AM	PM	AM	PM	AM	PM	AM	PM
	Plenary								
A	Shot/Fishing Sinkers								
B	Gasoline/Additives								
C	Ceramic Ware								
D	Plastics								
E	Paint/Ink								
F	Faucets & Water Coolers								
G	Crystal Ware								
H	Municipal Solid Waste								
I	Soldered Food Packaging								
J	Cosmetics								

ANNEX 2

INDIVIDUAL REPORTS FROM THE 10 SESSIONS

REPORT OF THE WORKSHOP ON LEAD SHOT AND FISHING SINKERS

1. PRODUCT INFORMATION

SHOT

Lead shot is better than alternatives in all respects, with the exception of toxicity

Substitutes

Steel

- Used the longest therefore better known; most agree on its characteristics
- Non-toxic; relatively low cost but higher than lead
- Inferior ballistic qualities but effective within accepted shotgun range
- May damage certain gm barrels; pressure testing may be required
- Problems in certain areas with embedding in trees, ricochets. and potential to cause fires in Australia

Bismuth and Bismuth Alloys

- Closer to lead in ballistic properties
- No demonstrated toxicity to waterfowl; little information on dissolution rates or toxicity of bioavailable forms to aquatic and terrestrial organisms
- Significantly higher costs; because of limited supplies of bismuth, increased demand would further increase costs.
- Current and projected production would only account for traction of world usage of lead shot

Zinc

- Poor ballistic properties
- Under evaluation for toxicity

Tungsten polymer

- Close to lead in density although costly

SINKERS

Lead

- Many advantages (cost, case of production etc.)
- Small-sizes tan poison waterbirds
- Lead impregnated bottom ropes used in fishing nets can increase the amount of lead in solid waste stream
- Sinkers lost in streams/rivers can slowly break down the significance of which is uncertain

Substitutes

- Includes steel, iron, bismuth, tin, copper, tungsten tungsten-terpene resin, antimony, plastic, steel and zinc.
- Toxicity issues similar to that described for shot

2. ROUTES OF EXPOSURE

SHOT

Wetland hunting over shallow and marshy waters

- Waterfowl and other species of waterbirds can ingest lead shot directly (availability of lead shot influenced by substrate and weather)
- Predators/scavengers are exposed indirectly through ingestion of embedded shot and shot fragments
- Humans may be exposed to lead through the consumption of meat containing shot and shot fragments

Dryland hunting

- There is no evidence that this is a problem or that a significant number of birds are affected, but there is some evidence that doves and geese ingest shot from dry fields in North America
- Predators/scavengers are exposed indirectly through ingestion of embedded shot and shot fragments
- Humans may be exposed to lead through the consumption of meat containing shot and shot fragments

Shooting ranges

- Localized problem; only concern with birds is with sites which include wetlands
- Use of lead shot will increase levels of lead in the soil and may increase the level of lead in drinking water in areas with acidic soil

SINKERS

- Fish-eating birds may ingest small sinkers and lead fishing tackle used by anglers
- Waterfowl and certain waterbirds may ingest small sinkers used by anglers
- Secondary poisoning of scavengers not substantiated
- There are concerns about exposure to aquatic organisms but there are no data available
- There are concerns about human exposure to lead resulting from the home manufacture of lead fishing sinkers, but there are no data available

Lead impregnated bottom lines may increase the amount of lead in the municipal solid waste stream

3. INTERNATIONAL DIMENSIONS

Migratory Waterbirds

SHOT

- Ingesting lead shot can kill an appreciable number of migratory birds thereby causing transboundary impacts
- Embedded lead shot or fragments can cause poisoning of predators or scavengers in another country

SINKERS

- Some evidence that ingested lead sinkers can cause mortality. This subject is now under investigation, but the scale of the problem is not well understood

International Trade In Products

SHOT

- Multilateral agreement on toxicity to birds and other organisms of substitutes (except steel) would be useful.
- International barriers to trade not perceived as a major issue. However, national bans, while acceptable under GATT, will affect markets for exporting countries

SINKERS

- While there is some international trade in sinkers, this was not identified as an issue
- International Shooting Competitions
- Present rules for international competition require the use of lead shot
- Countries which have restricted the use of lead shot have made exceptions for competition purposes

4. POSSIBLE SOLUTIONS

- Solutions can be implemented locally, nationally, bilaterally, regionally, or by the OECD.
- Proposed substitute materials have to be related to identified problems.
- Education awareness campaigns and voluntary agreements may have the effect, over time, of reducing use of lead shot and sinkers where desired

SHOT

Wetland Hunting

- There is agreement on the need for non-toxic substitutes

- steel is well established - bismuth is becoming established
- zinc is under evaluation for toxicity to waterfowl
- tungsten polymer is expensive
- aquatic toxicity of substitutes, with the exception of steel, is not well understood
- no toxicity testing protocol for substitutes have
- been agreed to by OECD member countries

Dryland Hunting

- No agreement on the degree of bird poisoning through the ingestion of lead pellets deposited on drylands
- Despite some limitations, non-toxic shot such as steel can be used for this purpose

Shooting Ranges

- Ranges where lead shot is used should avoid wetlands or areas where groundwater contamination may become an issue because of local conditions of soil acidity
- Substitutes for lead shot may be used in such areas

SINKERS

- In absence of evidence of the extent of the problem, the need for wides-cale bans is questioned
- Where there is an identified problem of toxicity to waterbirds, the use of substitutes should be encouraged
- OECD countries should be encouraged to define the extent of the problem to waterbirds as well as to investigate the impact of lead from fishing sinkers on aquatic organisms
- For lead impregnated bottom ropes, substitution with less toxic alternatives (e.g. steel) may be appropriate

5. POTENTIAL IMPLICATIONS

SHOT

Wetland Hunting

- Move to non-toxic shot will be beneficial to waterfowl populations and other organisms
- Substitution will increase costs for consumers

Dryland Hunting

- No need for change indicated

Shooting Ranges

- Potential need for management at a local level to encourage appropriate siting, resiting from sensitive areas, and reclamation of spent shot

SMALL SINKERS

- Movement to replace small sinkers with non-toxic alternatives will benefit waterbirds where lead
- poisoning has been occurring
- Substitution will increase costs to consumers
- Widespread ban on commercial manufacture may increase the home manufacture of lead sinkers

LARGE SINKERS

- Substitutes for lead weights may have economic implications for fishing fleets in certain countries

LEAD BASED GASOLINE ADDITIVES

1. PRODUCT INFORMATION

Tetra-alkyl-lead (TAL) is primarily used as an additive to raise the octane rating of gasoline. High octane gasoline permits the use of more efficient car engines with high compression ratios Lowering the octane number by one point reduces fuel economy by an estimated 1 to 2%. TAL also acts as a valve seat protector/lubricant for engines without hardened valve seats World-wide TAL production is now estimated at 150,000-t/a with lead content of about 60,000t/a.

TAL is generally combined with so-called lead scavengers to keep the lead volatile and thus minimize its accumulation in the engine and exhaust system. The scavengers, ethylene dibromide and ethylene dichloride, are both listed as carcinogens. In the engine, they generate acids which keep the lead volatile but also can corrode parts of the engine and exhaust system. Gasoline formulations with low levels of lead additives may be used without scavengers.

Austria, Canada, Japan and the United States have now essentially c& completed a phasing-out program for leaded gasoline. Major MP manufacturing sites for TAL are now in the United Kingdom Italy, France, Germany and Russia. The maximum legal lead content of leaded gasoline in the European Union is now set at 0.15g/1 (except in Portugal and Greece where the standard is 0.4g/1) . A table indicating the market share of unleaded gasoline in several countries including OECD countries is annexed.

2. ROUTES OF EXPOSURE

During the combustion process in the car engine. TAL is converted to inorganic lead and emitted in the car exhaust as either lead halides or lead oxides. Lead in this form is considered bio-available depending on particle size and speciation.

The principal short- term route of exposure is via inhalation. Longer term exposure arises when this airborne lead enters other human exposure media such as dust, water (from direct deposition and run-off), soil and the food and drinking water.

Studies conducted in OECD countries have demonstrated that changes in total airborne concentration of lead, particularly in areas of high traffic densities, are closely correlated with changes in the use of lead in gasoline except in the vicinity of high emission point sources.

Studies have also indicated a correlation between the use of leaded gasoline and lead blood levels in the population. In other studies however, this correlation has not been evident.

occupational exposure to TAL occurs at the manufacturing stage and at gasoline filling stations. Studies of persons exposed to traffic such as police officers and toll-booth attendants. Also report increased exposure to lead emissions from cars.

3. INTERNATIONAL DIMENSION

A substantial percentage of lead emitted from car engines will deposit within short distances from the roadways. The remaining lead particles are small in size so atmospheric transport processes can cause a longer range dispersion and some transboundary deposition. In addition, natural and other anthropogenic sources also contribute. The nature and extent of the transport will vary with meteorological conditions.

While some transboundary deposition from lead gasoline additives may occur, governments from some countries have not identified this issue as a significant public health concern. The situation is different in Europe where a number of countries are expressing concerns. As a consequence of high traffic density and the proximity of national borders, transboundary deposition through the air and water media is more likely to occur.

National legislation on lead content, octane rating and other specification of motor gasoline. In pursuit of environmental and health objectives are not inconsistent with GATT. The long experience with gasoline lead additives phasing-out or reduction programs undertaken by OECD countries has not given rise to significant international trade problems to date.

A number of international agreements are relevant to the issue of transboundary pollution e.g. the UNECE Convention on Long Range Transboundary Air Pollution; the NAFTA side agreements on the environment, the Paris Convention and the U.N. Arctic Monitoring and Assessment Program.

4. POSSIBLE SOLUTIONS

The complete phasing-out of lead additives in gasoline is technically feasible. Austria, Canada, Japan and the United States have already done so. It is noted that all other OECD countries have in place programs to significantly reduce the use of lead additives or phase them out completely.

The experience of OECD countries indicates that the gasoline lead additives reductions or phasing-out programs vary from country to country. The switch to unleaded gasoline is generally implemented in stages and takes into account national circumstances and priorities, including economic, technical, social and environmental factors.

As a consequence of the removal of lead based fuel additives, a number of strategies have been adopted to meet fuel and transportation requirements in specific countries. They include the use of alternative means to maintain gasoline octane levels, vehicles, reformulating automotive fuels more broadly, reengineering auto engines and alternative transportation policies.

A number of approaches have been used to obtain the desired gasoline octane levels. These include increasing the percentage of aromatics, olefins or volatile organic compounds which may be accompanied by the use of blending components such as oxygenates (MTBE, ETBE and alcohols) and/or octane enhancers.

In the early 1970s, a few countries adopted regulations requiring catalytic converters to reduce auto emissions contributing to urban air pollution and acid precursors. This decision required the introduction of unleaded fuels to protect the catalyst. The removal of lead from gasoline may result in fuels with increased levels of aromatics and other toxins to maintain the octane rating otherwise obtainable with TAL. For these reasons, most countries mitigated the problem by the use of catalytic converters.

Most national programs to promote the appropriate use of unleaded gasoline have also included extensive public education campaigns to make drivers aware of the benefits and availability of unleaded gasoline. In Australia for example, an integrated campaign by oil companies, car manufacturers, motoring organizations and government together with a one cent price differential was successful in changing consumer preference. The campaign was directed at owners of cars designed to operate on unleaded gasoline.

In several countries taxation measures provided for a more competitive pricing of unleaded gasoline to minimize misfueling (the use of leaded gasoline in cars equipped with catalytic converters) and as an added incentive for drivers to move away from leaded gasoline.

5. POTENTIAL IMPLICATIONS

Fuels in transportation represent a complex issue in environmental policy. Any change in the complex may have multiple effect on the environment and human health including occupational exposure, e.g. there may be increased exposure to benzene and other aromatics. Increased exposure to benzene and aromatics in unleaded gasoline and/or tail pipe emissions has been associated with certain types of leukaemia. This has implications for the assessment of policy options.

The switch to unleaded gasoline is technical feasible but there are significant costs associated with it which may vary considerably from country to country depending on existing refinery capacity and configuration, industry structure, fuel distribution network and nature of vehicle fleet as well as other policy settings.

The switch to unleaded fuel generally may mean an increase in crude oil consumption in the order of 1 to 5%. This is not only an economic penalty because an increase in crude oil consumption also means more emissions. As indicated earlier, if octane is not maintained in unleaded fuels, vehicle fuel economy is reduced by 1 to 2% per octane number loss.

ANNEX
DOMESTIC MARKET SHARE OF UNLEADED GASOLINE IN OECD COUNTRIES

COUNTRY	UNLEADED GASOLINE SHARE PERCENT - YEAR
NORTH AMERICA	
Mexico	30 1993
U.S.	99 1993
Canada	100 1993
WESTERN EUROPE	
Italy	24 1993
France	41 1993
Spain	6 1992
United Kingdom	53 1993
Germany	89 1993
Sweden	99 1994
Switzerland	65 1992
Netherlands	75 1993
Portugal	21 1993
Turkey	.5 1991
Austria	100 1993
Belgium	57 1993
Norway	50 1992
Luxembourg	691993
Denmark	761993
Ireland	381993
Finland	70 1992
Greece	23 1993
FAR EAST AND OCEANIA	
Australia	45 1991
New Zealand	30
Japan	100

CERAMICWARE REPORT
September 14, 1994

PRODUCT INFORMATION

Lead has been used as a chemical component of glazes and decorations of ceramic tableware for centuries.

Lead dramatically improves the chemical durability of glazes and colours, helping them to withstand detergent attack. It produces a smooth, durable hygienic surface that resists scratching and knifemarking. Lead allows the glaze to be melted and fluxed easily. It increases the strength of the bond between glaze and substrate. Lead heightens the brilliancy of colours. It maintains the surface film integrity of the coat.

By contributing to the proper rate of expansion and contraction of the glaze lead allows the glaze to "fit" the ceramic body thereby discouraging temperature-induced chipping cracking or crazing of the glaze.

Lead imparts functional and appearance characteristics to ceramicware that, according to technical experts no alternative material is able to completely duplicate. Boron use would not provide a suitable substitute for lead as it does not impart appropriate durability.

According to technical experts many ceramic tableware products could not be produced without the use of leaded glazes and/or colours. This, however is not to say that lead is required for the manufacture of all ceramic tableware, as evidenced by varieties of ceramicware on the market that are manufactured with unleaded glazes and decorations.

ROUTE(S) OF EXPOSURE

A source of exposure occurs through consuming food into which lead has leached from the ceramicware glaze or decoration. It is the propensity of the product to leach lead and not its total lead content that gives rise to exposure concerns.

The amount of lead that can leach into food is dependent upon a number of factors:

- composition of the glaze and decorations firing conditions and other process controls pH, temperature. and physical state of food (e.g., moist, liquid)
- food contact time

Certain types of ceramic article/food combinations maximize the potential for lead leaching to occur, i.e., cups and mugs used to hold hot acidic beverages and pitchers used to store acidic juices.

At this stage. the correlation between reduction In **human** exposure brought about by lower leaching standards. and actual risk has not been quantified. Since environmental exposure is also a function of the leachability of lead from ceramicware, this may characterize the behavior of lead in ceramicware following disposal to landfill.

However, the session participants acknowledged that the task of characterizing the environmental exposure arising from manufacturing and disposal was not the concern of this particular session.

Leach rates for ceramicware now on the market show a wide variation from pattern to patterns in some cases far above all applicable standards and in many cases well below the most stringent national standard. *De minimis* leaching rates have already been attained by numerous in individual patterns in every product category.

INTERNATIONAL DIMENSION

Ceramicware manufactured using lead-containing glazes and decorations is traded internationally and in large volumes. Since standards for the leachability of lead from ceramicware vary among the OECD countries or may not exist in others. it is recognized that this may contribute to variability between countries in the potential exposure to lead from ceramicware. either domestically produced or sourced by importation.

The session recognized that the information was not available to quantify the significance of these transboundary effects. This variety adds complexity for all concerned parties (administrators. manufacturers. and also consumers) and it may increase the risk of non-compliance.

POSSIBLE SOLUTIONS

The session participants recognized that control of the leaching of lead from ceramicware was the key to reducing the potential public health risks associated with this product. The issue papers considered by this group advocated lead leaching standards that are safety-based.

Adopted standards should encourage the use of state-of-the-art technology and production controls and take into account available information regarding potential exposure from different product categories and use patterns (e.g., flatware, large hollowware cups and mugs). The importance of effective enforcement of applicable standards was acknowledged by all participants. It was also acknowledged that there was a need for both technical and implementation criteria for the setting of limits for leachability. but that this requires further consideration.

POTENTIAL IMPLICATIONS - Views of some participants

To accommodate divergent views, the meeting agreed to accept attributable inputs from the participants:

- The US Delegation and the Coalition for Safe Ceramicware took the position that harmonization of national standards based on considerations of public health protection and state-of-the-art manufacturing capabilities would make compliance and enforcement more effective. The US FDA’s standards were offered as a basis for future discussions towards harmonization of national standards and/or development of a uniform international standard.

- The Delegations of UK, Germany, Japan and Australia and the session participant from Canadian industry took the view that if harmonization of standards was required they should be safety based and related to actual exposure. The above participants believe that the OECD is not however the appropriate forum to consider harmonization. Any such harmonization would need to be GATT consistent.

- The French Delegation is in favour of harmonization and adoption of standards that are safety based and related to actual exposure. Although the OECD is not considered the appropriate forum to determine the standards to be adopted. the OECD could encourage further discussion on this point. which requires taking into account the third paragraph of **Possible Solutions**, after considering existing standards such as ISO and EU Directive 84/500.

SUMMARY REPORT OF WORKING GROUP ON PLASTICS
INCLUDING COMMENTS MADE DURING THE PLENARY SESSION
Toronto, 12-15 September, 1994

Product Information

Lead is used as a stabilizer principally in PVC products and as a pigment in specific types of plastics.

Products that contain lead as a stabilizer in PVC are primarily to be found in construction applications with a long life, primarily:

- rigid pipes,
- rigid window profiles,
- flexible wire and cable insulation.

Plastic products that contain lead chromate as a pigment include:

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- plastic masterbatches,
- finished products coloured with the pigments (e.g. containers, bags, film, sheeting etc.).

Total lead used in plastics world-wide in 1990 was about 93,000 tonnes or 1.5% of total lead production.

Trade volume in plastic products containing lead stabilizers is small.

Lead chromate pigments are traded internationally as are plastic masterbatches containing the pigments and finished plastic products.

Routes of Exposure from Products

Some laboratory measurements have reported detectable leaching of lead from PVC pipe containing lead stabilizers. The most likely routes of exposure would be by ingestion or inhalation. Lead stabilizers are not used in PVC pipe for potable water in Australia, France and the USA but are approved in other OECD countries. PVC lead stabilizers are not used in medical applications; its use is regulated in toys, food and beverage in OECD countries and, as far as is known, not employed.

The most likely situation where exposure can occur is in manufacturing. However, worker safeguards and environmental regulations are in place in OECD countries.

For the identified uses of lead pigments. and stabilizers the potential for human exposure is minimal because the lead content is locked in a stabilizing matrix creating a situation of very low availability.

International Dimension/Concern

Exposure to lead from these products is considered minimal. It follows that the health risks from plastic products and their user is negligible.
The group identified that there is no demonstrable transboundary effect from the movement of these products.

Possible Solutions and their Potential Implications

The group was therefore of the view that there was no need to consider possible solutions and their implications.

Other Considerations

Contribution to the Discussion on Solid Waste

The Nordic countries pointed out that all lead products must be managed in one way or another at the end of their useful life. According to a mass balance flow calculation related to Denmark and Sweden, based on 1980's data, the incineration and management of all lead products would lead to a slow increase of the lead concentration in soil in the Nordic countries over time. The Nordic countries recognised that the impact of lead-containing plastics could not be quantified and is probably small. Nevertheless, lead in plastics would add to the overall impact into the environment via landfill or incineration and was therefore considered to be of concern.

Other members of the group, citing data in the OECD Monograph on Lead (pp. 71 and 115), disagreed with the conclusion. They indicated that evidence from the Monograph demonstrated that lead emissions and depositions are decreasing. therefore, an increase in lead in soil is questionable.

The incineration and landfill of lead-containing plastics in individual countries was identified as not a matter of international concern. The Nordic countries, however, pointed to their administrative difficulties of implementing national product regulations in the absence of international regulations.

Others considered that national regulations could be designed within existing multilateral trade rules and that individual countries should not shift the burden of their regulations onto other countries.

FINAL DRAFT WORKING GROUP
PAINT AND INK SESSION
14 September, 1994

Although the workshop was intended to address both inks and paint, it was agreed that ink issues would only he raised on an exceptional basis. No significant ink issues were identified and, therefore, this report is dedicated to paint.

PRODUCT INFORMATION

PRODUCTS	USES	PURPOSES	TREND
Siccatives	Solvent paint	Film drying	declining-more to H_2O based latex
Pigments	Steel primers	anti-corrosive	declining because of containment costs
	Consumer paints	opacifier	replaced by TiO_2
		colour	prohibited
	Industrial paints	opacifier	replaced by TiO2
		colour	some substitution
	Traffic paint	colour	some substitution

- Lead chromatic pigments account for approximately 1% of lead overall usage annually.

- currently, lead-based paints have no perfect substitutes with regard to all properties (i.e. colour, brightness, cost effectiveness, insolubility. opacity. non-bleeding in solvents, and durability) but substitutes of acceptable quality exist for many uses.

Major uses of Pb-based paints today:

- Refinishing of motor cars
- As anti-corrosives undercoat in auto-industry (primarily U.S. and Japan) and public works (bridges and roads - (U.S. and Canada).
- Art materials
- Inks and crayons (not so much domestic use in OECD countries. but a concern about imports from other countries and a lack of labelling to identify contents)
- Industrial applications (e.g. in Australia for uses in oil refineries and mines).
- Toys (use declining, but still a concern, primarily with respect to imported goods from non-OECD countries).
- Road marking in some countries

ROUTES OF EXPOSURE.

- primary routes of exposure (historic and current) are through inhalation or ingestion of Pb-containing products.

6 scenarios of exposure identified:

ACTIVITY	TREND
manufacturing Pb-containing paints and pigments	declining with increased development of occupational health and safety (OH&S) standards by OECD countries
application of Pb-based paints	not known to be a significant route of exposure in organised industries where appropriate OH&S regulations are enforced
use of products containing Pb	lower as production of products utilizing Pb-based paints is declining
maintenance of surfaces containing white lead paint	increasing area of concern particularly in renovation of older structures (ex. dust from sanding)
removal of white lead paint	removal of applied Pb-based paints is a serious concern in terms of OH&S standards and procedures applied during removal and clean-up of dust created by removal. Concerns were expressed with the apparent lack of standards of contractors.
degradation and decay of white lead paint	on balance, probably greatest route of exposure is decay of Pb paint applied to surfaces such as windows, doors, and exteriors.
lead in soil	could be of importance around houses painted with white lead and deteriorating

- It should be noted that although the contribution is small, paints may find their way into the waste stream
- and add to environmental contamination.

- Greatest overall exposure risk is to small children and pregnant women resulting from maintenance, removal. and degradation, but remains a result of the past use of lead

- carbonate containing residential paints.

- Most exposure occurs at the residential level

- Regulations and voluntary actions, in many countries have greatly reduced the use of Pb-based paints and the potential for exposure in manufacturing, use. and disposal. Use of white lead paints has been prohibited in OECD countries for some years. Use of paints containing other lead compounds is tightly regulated

- Enforcement of regulations and standards may be inadequate in some countries (ex. U.S. anti-corrosives removal from bridges)

INTERNATIONAL DIMENSIONS

- Exports of lead paints is very small and continues to decline

- Paints are almost always used in the countries where they are produced, with the exception of small volumes of specially paints used in automotive refinishing, marine and heavy duty machinery applications.

- Chromated pigments. including pigments to be used in paint and specialized compounds are traded internationally.

- Issues arise regarding transboundary movements of goods (ex. cars, toys, and appliances) containing Pb-based paints, and pigments vis-à-vis labelling and public awareness, recycling and final disposal (product stewardship). Products imported from other jurisdictions may contribute to the domestic waste stream. lie extent of this contribution and the consequences therefrom. are currently unknown.

- The international dimensions of exposure by migration through water and air are probably not significant.

- Relative to other sources of Pb contamination, the international dimensions associated with Pb-based paints are relatively minor. No evidence was introduced to indicate that the level of Pb contained in products currently produced in OECD countries give rise to significant health risks. However, continued use of lead in paint applied to structures and roadways and their deterioration over time could entail some incremental release of lead to the environment

POSSIBLE SOLUTIONS

- Industrial development of alternative materials and techniques has resulted in major reductions to risk of exposure to Pb.

- Further improvements may be realized by consideration and implementation, where practicable, of the following alternatives:

    1. Develop alternative product specifications - working with customers, governments and standards organizations to adopt new product specifications to allow for use of non-Pb paint colours (e.g. changing traffic paint specifications to allow for 1) alternate yellow paints, or 2) alternate colours - argued by some participants that for safety reasons, white was not a viable alternative although other countries have shown that change did not affect traffic safety).

    2. Utilize common test methods and terminologies - (i) in products: use of common standards regarding Pb content of products and media would require harmonization of test methods and monitoring requirements, while factoring in geographic considerations; and (ii) in biological and environmental testing: biological monitoring methods offer a better means of assessing exposure for individuals.

3. Harmonization of labelling requirements: already exist but not universally applied. Some argue that paints/pigments incorporating intentionally added Pb should be labelled, while others caution that requirements should not over-state the dangers and risks associated with the product (e.g., skull and cross bones indicates an acute poison and was considered by some not to be appropriate to identify the use of Pb chromates in paint).

4. Communication of safety precautions - develop public awareness of risks associated with Pb-containing products and of the alternatives.

5. Promotion of move to no intentional addition of Pb in various paints. Some agreed for endorsement of a best available practice of no intentional addition of lead in paints for residential. traffic, steel structure and automotive paints. Others argued that in some circumstances there are no viable alternatives and that sufficient transition time is required to avoid confusion, market upset, and allow sufficient time to develop substitutions.

6. Better communication of possible alternatives and strategies - several countries have found satisfactory substitutes or alternatives of which others were unaware. A mechanism for exchange of such approaches, possibly through a central OECD repository. is highly desirable.

POTENTIAL IMPLICATIONS

Selection of alternatives must take into account the following:

- Technical effectiveness - presently substitutes to existing Pb-based products may not meet customers current specifications. It may be possible to develop alternative products meeting revised specification

- Need for adequate time to develop and implement changes - sudden changes can create confusion, increase capital costs, create shortages of materials and instability in markets.

- Costs of implementation - both negative and positive monetary implications should be assessed.

- Diminishing return - using the process of risk management to assess the relative advantages of alternatives against other environmental priorities.

Alternatives are not always is effective in terms of quality and available quantities:

- Colourants - may not he as bright but alternatives may he promoted through customer education.

- Anti-corrosives - some alternatives are available but more time is required to develop adequate replacements for certain purposes. Some believe such initiatives should be promoted on a voluntary basis. while others believe mandatory action on a reasonable timefrarne is appropriate.

GENERAL OBSERVATIONS

- Costs to reduce hazards will have a direct relationship to the period of time allowed to find alternatives

- In some countries, clean technologies are developed through co-operation and financial support of government and industry.

- There is an emerging trend in industry to move away from reactionary measures to applying more proactive approaches.

- The most effective means to continue improvements and maintain positive trends will depend on application of the following:

  - objective science in setting standards;
  - life cycle analysis, including toxicity of substitutes and cost-effectiveness;
  - development of a rational process for assessing appropriate uses and applications;
  - better communication of effective strategies (e.g. central OECD repository);
  - continued international commitment

SESSION F: FAUCETS/WATER COOLERS
September 14, 1994

FAUCETS

1. Product Information

Copper alloys (brass or bronze) have been used for most plumbing fittings (currently close to 100%) on the pressure side of the plumbing system for nearly 100 years. The majority of the brass used in plumbing goods comes from copper alloy scrap and some of that scrap is from old car radiators. which contain lead solder. Most control valves and end-of-the-line devices such as faucets have been and still are made from brass. Most of the plumbing brass used contains some lead, typically between 1.5%-7% in North America and 2%-5% in Europe. Lead is used in brass alloys and other plumbing materials due to its long life and low corrosivity. These plumbing products are expected to be in service for several decades. Lead has the potential to leach into drinking water from various materials in the distribution system, including lead pipes. lead solder used to join copper pipes in household plumbing. and brass faucets. valves and fittings.

Brass plumbing goods are produced by four different methods with various percentage of lead: 1) sand casting (5%-7%), 2) permanent moulds (2%-3%), 3) forging (1.5%-4%) and 4) fabrication by machining extruded brass rod (1.5%-4%). The permanent mould casting process is a commonly used method to manufacture cast plumbing products including faucets. in Europe.

There are several reasons for including lead in the brass alloys that are used in the manufacture of faucet fittings. In cast alloys, lead provides pressure tightness by sealing the alloy. causing it to be less permeable. In addition. lead inhibits the corrosion of other metals in the alloy. and thus lengthens the life of the product. Lead also increases the machinability of the brass by acting as a lubricant and as a chip breaker. Lead therefore permits brass components to be machined at economical production rates. The presence of lead in the alloy also aids in final product finishing and polishing.

2. Routes of Exposure

It is known from the literature and from industry testing programs that lead leaches from plumbing fittings. The amount of lead leaching is variable and depends on several factors including manufacturing process, water chemistry. surface area, contact time and the length of time the product has been in service.

The amount of lead that may leach into the water from a brass faucet or a fixture fitting is not solely related to the amount of lead contained in the alloy. Comparison of the lead leaching performance of several faucets manufactured in the United States by different processes having various lead content revealed that fabricated faucets tend to leach the least amount of lead, followed by those manufactured by the permanent mould process, then sand cast models, regardless of the lead content of the brass alloy.

3. International Dimension

Countries have developed or are developing material specification or performance standards for products that come into contact with drinking water. For example, a voluntary health-based performance standard for such products has been developed in the United States through h the National Sanitation Foundation International (NSF), ANSI/NSF Standard 61 (NSF 61). While NSF 61 is voluntary. It has been adopted as a minimum legal requirement for water delivery system products by 46 states. In Canada. NSF 61 is being considered as a national voluntary standard.

In Australia, manufacturers and importers have to meet four different standards: 1) dezincafied resistant brass standard, 2) low lead solders standard. 3) lead content of water fittings standard and 4) an extraction of metals test standard. Based on the World Health Organization drinking water guideline for lead (10.0 ug/L[1]), CEN (responsible for European standards) is developing a standard test method to evaluate materials in contact with drinking water. This may lead to consideration of material specification or performance standards for European countries.

Plumbing fixtures are traded internationally. Current standards are relatively new or under development and international implications have not yet become evident.

The World Health Organization guideline value represents the concentration of a constituent that does not result in any significant risk to the health of the consumer over a lifetime of consumption.

4. Possible Solutions

Possible solution for reducing human exposure to lead leached from faucets into drinking water include both technical and regulatory aspects.

Technical aspects include modification of existing manufacturing processes: materials. surface area and coatings. Manufacturers are exploring various means to reduce lead leaching levels in their brass products One of the product options being evaluated by the industry is the feasibility of replacing the lead containing brasses currently used in the manufacture of faucets and other plumbing fittings with lead-free or low lead alloys. The materials considered so far include silicone cast alloys, lead-free tin bronze, bismuth-brass, aluminium-bronze, copper-sulphur and other alloys. The feasibility of using these alloys is dependent on how closely they match the material properties of the leaded brass alloys currently used. These properties include castability, forgeability, machinability, solderability, porosity, polishability, plateability, recyclability, corrosion resistance and the toxicity of material used in the alloy to replace lead. Plastics may also be considered.

Other than material substitution. there are many possible product designs that have reduced surface contact area of lead containing materials with drinking water that may be considered.

Preliminary evaluation of a chemical process utilizing sodium acetate to selectively remove surface lead has been conducted. While promising on the laboratory scale. it appears to be impractical for commercial use based on pilot plant studies. A permanent coating of the wetted surface of the faucet or plumbing fixture fitting continues to be explored as a possible option to prevent the leaching of lead.

Application of corrosion control techniques by water utilities are also being considered as an option to control lead leaching from plumbing fittings.

At presents regulatory aspects for reducing lead exposure from faucets are being carried out or developed at the national level. Information on approaches and test methodology could be shared among countries and possible harmonization could be considered in the future.

5. Potential Implications

The use of lead in plumbing fittings raises issues for international consideration primarily due to movement of products among both OECD and non-OECD countries. Depending upon different national regulations, it is possible that many companies will have to change the way, they make faucets and fittings and/or the materials they use in order to market their products internationally.

The economics of manufacture is major factor influencing the feasibility of using a low lead or lead-free alloy. The absence of lead makes some of the lead-fee alloys more difficult and time consuming to machine than the leaded brasses. as well as increasing the wear and frequency of replacement of the cutting tools. The brass fittings industry has estimated a total production cost increase from 5% to 50% depending on the material selected and manufacturing process.

A large portion of the brass used in the manufacture of plumbing fittings is left over as scrap. In some instances, as much as 80% of the brass used in some machined brass products will end up as scrap. Recovery of the costs of machining scrap is important to the economical manufacture of brass faucets and fittings. Some of the lead-free alloys used to replace leaded brass may not be compatible for recycling. Contamination of the scrap recycling stream by some of the lead free alloys (e.g. bismuth-brass) will make other scrap brasses unusable unless alternate markets can be identified. The implications of not using leaded brass scrap for plumbing brass are: 1) significantly more virgin copper will have to be used for plumbing products and 2) some means of use or disposal must be found for scrap brass now committed to plumbing.

New requirements to substitute other metals for lead may cause the plumbing manufacturers, which previously used recycled materials, to switch to more expensive and energy intensive materials. The use of substitutes for lead could result in adverse economic effects for plumbing manufacturers and for foundries and brass and bronze ingot producers. who recycle car radiators and other products.

Design changes to reduce surface contact area of lead containing materials with drinking water will involve tooling costs which may or may not be significant. These tooling costs will depend upon what design options are available. If new manufacturing processes are involved. significant capital investment may be required.

WATER COOLERS

Water coolers are used mainly in North America and Australia. All water coolers currently manufactured in these countries contain lead-free materials for those components that come in contact with drinking water. The materials used include stainless steel, lead-free alloys and approved plastics. The Workshop determined that any necessary action to remove lead has already been taken and therefore no OECD consideration is necessary.

LEAD CRYSTAL
September 14, 1994

1. PRODUCT INFORMATION

Lead is introduced into the raw material, melted at high temperature becoming incorporated into the glass matrix.

Lead imparts unique qualities to crystal, these being:

- brilliance
- high refractive index/high dispersion without colouring
- economic melting temperatures/long working range suitable to traditional methods of handworking and machining
- high density
- softness to permit cutting/decorating
- chemistry suitable to acid polishing
- high durability.

The European Union defined two categories of lead crystal as follows:

Description	Metal Oxides	Density	Refractive Index
Full lead crystal	PbO -≥ 30%	≥3.00	≥1.545
Lead crystal	PbO - ≥ 24%	≥2.90	≥1.545

There are other types of glass which may contain lead below 24% PbO and therefore cannot be described as lead crystal under the terms of the European definition.

Although some countries do not have a specific definition for lead crystal the above definition is widely accepted throughout the industry. The USA has a law defining lead crystal as glass with ≥ 24% PbO but this is for excise purposes only. Almost all the world production of lead crystal comes from OECD countries and is traded within those countries.

2. ROUTE OF EXPOSURE

Lead crystal is a source of human exposure through leaching and migration from the surface of the glass. The routes of exposure are through contact with foods and beverages. The highest individual exposures are likely to result from long term storage of alcoholic beverages in lead crystal decanters. After first use, further use results in reduced leaching and therefore exposure declines significantly after first use.

It is recognized that young children are a critical exposure group with regard to the adverse effects of lead. For this particular route of exposure (migration of lead from internal surfaces of crystalware) however, although young children could be exposed it is unlikely since they are not frequent users of lead crystalware.

To evaluate exposure from crystalware an independent study was commissioned by I.C.F. In consultation with the U.S. F.D.A. The results indicate that for the studied populations (middle-aged men and women of child-bearing age), this source of exposure is unlikely to contribute to a significant public health concern.

3. INTERNATIONAL DIMENSION

The only international dimension of this issue is through trade and the international trading is primarily within the OECD family of countries.

4. POSSIBLE SOLUTIONS/IMPLICATIONS

- The participants recognized that control of the leaching of lead from lead crystal was the key to reducing exposure associated with this product.

- The meeting recognized the existence of the voluntary standard developed by the ICF, which is followed by a majority of the industry and appreciated that this is more stringent than that of the ISO. The XF standard could form the basis of an international standard.

- It is acknowledged that the current ICF voluntary standard has contributed to reducing the level of exposure.

- The technical reasons for the differences between the units of measurement (for flatware) between the two standards should be examined.

- Efforts should be made to ensure that a definition of lead crystalware (e.g. European Union definition) is universally recognized.

- Continue technical progress such as:

  i. Improved product formulation;
  ii. Surface treatment techniques;
  iii. Process control techniques.

- Products exhibiting some progress in these areas are under development and in come cases are already commercially available.

- The importance of consumer information/education is recognized. The IW has devised a customer care booklet which will advise consumers on how to take care of their crystalware with special advice about its use for storage.

- It is acknowledged that for all . possible solutions consideration must be given to not only what is technically feasible but also what is cost-effective.

- No substance has been identified that can impart to crystal all of the attributes of lead.

FINAL REPORT OF WORKING GROUP
MUNICIPAL SOLID WASTE
Toronto, September 14, 1994

1. PRODUCT INFORMATION

Municipal solid waste (MSW) is a composite of consumer materials discarded after their useful life. This material is comprised of the following principle components:

WASTE TYPE	% TOTAL OF WASTE (range)	% TOTAL OF LEAD CANADA 1991	% TOTAL OF LEAD FRANCE 1988
Organics	25 - 60	38.0	5 - 13
Paper/paperboard	18 - 40	20.0	18 - 19
Plastics	4 - 13	15.7	8 - 9
Fines < 10 mm		12.0	18 - 23
10 - 20 mm			13 - 16
Inorganics		5.7	1 - 9
Textiles		3.5	4
Metals - ferrous		2.9	35 - 41
non-ferrous		0.3	1
Glass	3 - 12	1.1	2
Other	6 - 28		
Rubber			2
Leather			1

Sources:
Canada: The WASTE Program Final Report of the Burnaby Study (1993).
France: INSA Heavy Metals in Household Refuse Origins, Chemical Forms, Contents (1988).

Some concerns were expressed about the high levels of lead in the naturally occurring materials (Organics) examined in the Burnaby Study. It was suggested that some unaccounted for anthropogenic sources of lead may have been present. Potential sources suggested include: paints and drying agents; environmental contamination from various sources including leaded gasoline and industrial sources; and atmospheric deposition.

Experience from Denmark based upon mass flow c analysis indicates the significance of different sources of lead in the combustible waste stream:

Paints	7 - 17 %
Plastics	15 - 30%
Cans and Bulbs	14%
Alloys and Metallic Lead	17 - 31%
Glass	6 - 9%
Other Sources	1 - 4%

The metallic lead component includes miscellaneous materials such as lead shots, toy figures. curtain weights, and wheel balancing weights. Other sources such as lead acid batteries and lead in building materials may contribute as well. Source: Costs of Lead related to Waste Products. Final Draft, August 1994.

2. WASTE MANAGEMENT AND EXPOSURE

MSW has to be properly managed. Proper management of some materials requires their separation from XSW. This is done to minimize contamination and improve the quality of reclaimed materials. After that, the principal waste management systems in order of priority are:

- recycling (including composting)
- incineration
- landfilling

National and regional waste management approaches may vary based upon appropriate national/regional circumstances.

Recycling

Recycling rates are increasing in many countries. These industrial processes conserve natural resources and reduce waste streams.

Composting

Composting is an expanding method of waste management in many countries for the organic portion of wastes (especially yard garden and food wastes).

Source separation improves the quality of the waste material and enhances the opportunity for successful composting by reducing the contamination from other MSW..

Potential routes of exposure include soil contamination.

Incineration

Incineration has the advantage of reducing waste volumes by up to 90 per cent and often provides the opportunity for energy recovery.

Air emissions from incinerators with appropriate pollution control systems, operated effectively, pose a negligible public health or environmental risk.

Other comments included:

The glass component (including ceramic ware and lead crystal) does not generally contribute significantly to lead in air and typically report to the bottom ash (or siftings).

Landfilling

Properly designed and operated landfill sites pose reduced risk, to the environment and, public health. Many landfills will require the long-term monitoring, collection and treatment of leachate.

In some countries the leachate is collected and treated at a sewage treatment plant. Potential routes of exposure that may require control include land, and surface and ground water.

Residuals Management Options:

The proportion of total lead found in residue streams as given (as percentages of input to the incinerator) in the following descriptions is indicative of general data. These values can vary depending upon the characteristics of the MSW and its processing. (Source: Burnaby Study, 1993).

Grate siftings

13% lead in this stream. Currently. siftings are usually managed with the bottom ash.

Bottom ash

58 % lead in this stream. Use is regulated in some countries (e.g. France,. Germany and Denmark) for road construction and embankments. The US does not regulate its use if it is not categorized as a hazardous waste.

Potential exposure includes land, fugitive dust and, surface and ground water.

In most countries where the material is utilized, the ash is "aged" for several months to stabilize the material. **Ash Only Landfill Cells:** This type of landfill cell is used in some countries. In the UK bottom ash is placed over stabilized MSW cells before final capping of the landfill.

Common disposal: In the U.S. bottom and fly ash, that 35 not exhibit hazardous characteristics and often are disposed with MSW in landfills. In the European Union (EU). disposal of mixed NSW and ash is banned.

APC residuals (fly ash): 29% lead in this stream.

Typically this waste is more leachable than bottom ash, with a greater likelihood of requiring hazardous waste management, including:

- hazardous waste treatment (e.g. fixation)
- hazardous waste landfill
- municipal landfill.(separate cell)
- monofill
- hazardous waste disposal in salt mines (e.g. Germany)

Potential exposure includes land and surface and ground water.

3. INTERNATIONAL DIMENSIONS

Transboundary

Transboundary air and water pollution problems for lead are insignificant if facilities are properly managed. Improperly managed facilities may contribute to transboundary pollution.

Trade

NSW is shipped across national boundaries for recycling and/or disposal. Transboundary movement of NSW is managed under bilateral or international agreements. Due to the economics. including the cost of transportation, NSW is usually not transported long distances.

Some participants viewed the fact that internationally traded products becoming part of NSW retain their international dimension. but others did not agree, particularly for products that are manufactured domestically as well as internationally with similar lead content.

4. POTENTIAL SOLUTIONS

Although no issues of a transboundary nature were agreed upon, the group went on to discuss some possible approaches.

The Nordic countries presented a proposal for the broad substitution of lead in products which end up in the municipal waste stream. The Nordic countries also presented information concerning the costs related to lead in waste products, that seems to indicate that substitution may be a cost effective option. at least with respect to the situation in the Nordic countries.

Most, but not all, experts from other countries expressed concern with the Nordic approach. Many stated that it was not necessary to broadly substitute lead from products based upon NSW management issues, which seemed to be adequately managed as indicated above.

There are a number of approaches that could be used to undertake the consideration of product substitution. Whatever methods are used. the key elements to explore include:

- the technical properties of the product and considerations of its redesign;
- the health and environmental considerations of the substitution;
- infrastructure changes needed to deal with the substitution;
- life cycle analysis;
- the costs of the measures and the benefits that will arise from these changes.

– Many opportunities for source separation are practicable, for example: lead-acid batteries, electronic components (televisions, computers, etc.). The EU has initiated a priority waste stream program which is assessing and potentially regulating a number of non-hazardous waste streams (e.g. tires, end-of-life vehicles and demolition debris).

– The reduction of lead content in bottom and fly ash could increase opportunities for utilization of this material.

– Grate siftings could be a potential source of lead for recovery.

– Ensure that all MSW facilities are properly managed.

General Observations:

There is a need to harmonize the definitions of terms used in the waste management field so that all members have the ability to share data and knowledge. This is an important step to achieve a better understanding of the fate and behaviour of metals, including lead. in waste management **systems**.

Additional study is required to characterize both the distribution of components in the waste **streams** and the waste management systems in all countries and the concentration of metals in these materials.

SUMMARY REPORT ON LEAD-SOLDERED FOOD CANS
14 September, 1994

PRODUCT INFORMATION

Lead containing solder has been used since the inception of canning technology to bind the can body side-seam and sometimes to bind the can body to can end.

Alternative means of can manufacture that do not use lead solder are available. Cans made by these methods may be: tin-soldered, welded, or drawn (stamped). Foods can also be packaged in cans protectively lined internally, or in plastic, glass and paper containers. The amount of lead in canned food has been reduced dramatically by both voluntary and mandated national activities in the last 15 years through the use of the foregoing techniques. The lead levels in raw food has also considerably been reduced over the same period in many OECD countries.

Voluntary industry and/or government action has led to reduction or cessation of use of lead soldered cans in most OECD countries, but some OECD and non-Member countries still produce some lead-soldered cans.

EXPOSURE

Exposure occurs through consuming food into which lead has migrated from the solder. Lead in food derived from lead-soldered cans can account for a significant portion of total exposure to lead through food.

Primary foci of concern include young children (and infants) and women of child-bearing age who consume canned foods.

Time and pH (of the food) affect the amount of migration that will occur. Liquid acidic foods, e.g., fruit juices, nectars. and drinks. generally accelerate migration of lead. But foods other than acidic foods, e.g., spinach and sardines, can contain significant amounts of lead derived from soldered cans (e.g., five times or more lead than found in raw food).

Nations that have phased-out the use of lead-soldered cans have realized significant reduction in the level of lead in canned food items. beyond the reduction of lead in the raw item over the same period of time.

INTERNATIONAL DIMENSIONS

Food packed in lead-soldered cans is traded internationally but no evidence was demonstrated of transboundary problems which cannot be addressed effectively by restricting imports of such products.

The amount of imported vis-à-vis domestically produced canned food will differ from country to country depending on a range of factors. Swedish data show that it imports 50% of its canned foods with 20-30% of these imports in lead-soldered cans. This equates to 10-15% of total cans sold in Sweden containing lead.

In the Netherlands It is estimated that about 80% of canned food is imported with 1-5% of all cans sold in the country being lead soldered. The percentage in other OECD Member countries was not available.

POTENTIAL SOLUTIONS

Possible solutions should continue to be pursed within the framework of the FAO/WHO Codex Alimentarius Commission or at the national level.

It is suggested that one justifiable approach for soldered canned foods would be to not exceed the permissible national concentration of lead in the corresponding raw food item. Another approach is to package food in a manner in which it does not result in the migration of lead from the solder into the food.

The objective would be to encourage producers to review their manufacturing processes. Possible means to achieve this objective would be, *inter alia,* (in order of preference):

- use of lead-free solder
- production of three-piece welded cans
- production of two-piece drawn cans
- switch to non-metallic food containers
- incorporation of functional barriers in cans
- use of strict Good Manufacturing Practices

IMPLICATIONS

The solutions mentioned above would imply investments in the can producing industry to convert existing production lines to be able to produce cans meeting the above specifications. Experience in the United States has shown that the conversion to cans not using lead solder required investments in the range of $700,000 to $1,500,000 (US dollars) for the installation of a three-piece can manufacturing line and from $12,000,000 to $15,000,000 for a two-piece can line.

To substitute non-metallic for metallic food containers would require new investment and would make existing capacity for metallic food can production obsolete.

COSMETICS
September 14, 1994

Within the context of this OECD workshop this product category was considered to be an issue of minor significance. However, some interesting points, mentioned below, should be brought to the attention of the OECD member countries.

PRODUCTS

- Kohl containing lead (up to 90%) is illegal in OECD countries.
- Hair dyes, containing low amounts (0.5 - 0.75%) of Pb acetate, are approved in many countries.
- Kohl-like or named products that do not contain Pb.
- Other cosmetics may have some lead through contaminated ingredients.

ROUTES OF EXPOSURE

Although there is only a small segment of the population that is affected, exposure can be lethal. The primary routes of exposure are through the eyes and ingestion: dermal absorption is very minor. Discharges into sewers are relatively small.

Scenarios of Exposure Identified

- Placing Kohl around eye, rubbing etc.
- Ingestion by licking brushes and hands.
- Removal (washing off makeup or hair dye) to waste.
- Dermal absorption.

INTERNATIONAL DIMENSION

- Traditional products made in non-OECD countries illicitly imported.
- Possibility of domestic industry is very small, no significant international involvement.

POSSIBLE SOLUTIONS

- Education

    - Ethnic and religious leaders of the dangers of Pb
    - General ethnic population
    - Country of origin

- Substitution of Kohl containing lead and Kohl-like products with non-lead alternatives is necessary (e.g. replace Pb by carbon).

- Alert entry point customs officials and provide literature or posters to inform new entrants.

- Good manufacturing practices in the cosmetics industry to ensure that lead contamination of the ingredients is minimized.

- Continue monitoring the cosmetic industry.

- Disseminate information to all countries possibly through an OECD repository.
-

POTENTIAL IMPLICATIONS

- Few, but serious poisonings can be avoided.

- Political and religious sensitivity may have to be addressed in the education and substitute process.

ANNEX 3
SUMMARY OF COMMENTS ON SESSION PRESENTATIONS/ REPORTS FROM THE 15 SEPTEMBER PLENARY SESSION

PLASTICS

- A question was raised as to why the plastics session was not concerned with human exposure to plastics with lead stabilizers when Japanese data showed that leaching from PVC pipes exceeded WHO drinking water levels.

- It was agreed that session participants would discuss the issue and make any necessary revisions to the text of the report. (Such changes have been made and are reflected in the final summary report included in Annex 2*)*

- A question was raised as to why the plastics session concluded that there was not an international dimension even though plastics with lead stabilizers or pigments are traded internationally.

- The chairman responded that even though there is some limited trade in products, since there was no exposure to the products there was no need for a solution.

- One commenter questioned why there was only a limited discussion of the waste aspects associated with the disposal of plastics.

- The chairman responded that his group did not have the expertise to discuss waste issues and furthermore, the municipal solid waste session was charged with examining such issues.

- One commenter expressed concern that the workshop was not structured to discuss this topic in either session. Another stressed the importance for manufacturers to consider how their products are disposed.

PAINTS AND INKS

- A question was raised as to whether all of the items listed in the report under "Major uses of lead-based paints" were in fact "major".

- The chairman agreed that the list heading was misleading and agreed to make the necessary change. (This change is reflected in the final summary report in Annex 2.)

FAUCETS AND WATER COOLERS

- It was suggested that the discussion on water coolers should indicate that the lack of concern today is the result of voluntary actions taken by industry to remove lead from parts that may contact water in coolers.

LEAD CRYSTAL

- A commenter, referring to page 4 of the UN ECE summary Paper, noted that the paper indicated that the relevant sectors for lead emissions included the glass industry. Despite this, the Lead Crystal session did not report on such emissions. Another commenter pointed out that the glass industry may or may not include crystalware.

- The chairman responded that the session focused just on lead crystal (i.e., glass containing greater than 24% lead oxide).

- Another commenter felt that the definition of lead crystal discourages manufacturers from developing similar products with less lead content since they cannot be sold as “lead crystal”.

MUNICIPAL SOLID WASTE

- The chairman stated that a paragraph approved by the session but not appearing in the text before the plenary session, would be added to the final version. (This change was made and is reflected in Annex 2.)

CERAMICWARE

- The chairman reported that a change would be made to the final paragraph.

- A concern was raised, similar to that in plastics, that there was limited or no discussion on the waste aspects associated with the disposal of the product.

- The chairman responded that it was outside the ambit of the session and the participants in the session did not have the skills to address this topic.

LEAD-SOLDERED FOOD CANS

- A commenter felt that it was unrealistic to rely solely on the restriction of imports to control any possible exposure.

- The chairman responded that Australia had an effective programme for identifying imported products which exceeded Australian safety levels.

- Another commenter responded that there were substantial costs associated with border inspections and that the effectiveness of this approach varied from country to country. It was suggested that the report reflect the experiences of a range of countries.

- A commenter suggested that it was not appropriate to mention possible solutions in the section on international dimensions.

GENERAL COMMENTS

- A concern was expressed that gaps in knowledge exist even after the workshop. Some products may pose a concern during use, and others after use (i.e., during disposal). Gaps exist for instance in a comprehensive understanding of the life-cycle of plastics where experts in the plastics session did not feel they had the expertise to discuss waste, and the waste group did not feel it had the expertise to discuss plastic specific issues. Another gap in knowledge was exposure to glass products, other than lead crystal.