

SCREEN PRINTING ASSOCIATION

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COATINGS LAB

October 31, 1972

James Williams
Please note and return
CAZ

TO: Associate Members known to be engaged in the manufacture or sale of inks and paints.

FROM: John M. Crawford, Executive Vice President *JMC*

As previously reported efforts have, and are being made, to restrict the lead content in paint. As some screen printers use paint, and due to the fact that many people fear these regulations could be expanded to specifically mention ink, SPA is attempting to keep abreast of these activities.

The following is our second report to you on this subject. The Association will keep you abreast of new developments.

A. LEAD - LEGAL AND RESEARCH REPORT

1. Federal

a. Amendments to P.L. 91-695

2. 3080 -- passed by Senate in June -- established levels of 0.5 and .06, consistent with FDA regulation and provided for research.

House Committee on Banking and Currency approved amendments to Section 1017 of "Comprehensive Housing Bill" which would establish only the 0.5 level on January 1, 1973, and would provide for Federal pre-emption re lead standards. Bill failed to clear House Rules Committee to permit final House vote.

b. FDA Regulation. On August 4, 1972 FDA confirmed order (of March 11th) establishing 0.5 level as of January 1, 1973; deferred action on .06 issue until later date -- many objections remained pending. August 4 Order confirmed FDA position that has applied only to products "shipped in interstate commerce" after December 31, 1972, and indicated that FDA would not initiate "repurchase" action.

2. States

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a. Louisiana law (Public Act 371) was amended in special session to provide for lead level and labeling consistent with Federal standards. Effective January 1, 1973 for paints manufactured after that date.

The official Association for the Screen Printing Industry. Members in North and South America, Europe, Africa, Asia and Australia. Screen Printing, all integral parts of the graphic arts, is a growing segment from industries of Process-Printed Advertising, Great Manufacturing, Commercial Printing, Grocery & Drug Packaging, Business Advertising and Textile Printing.

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2. States (cont'd)

b. Kentucky law (H.B. 467) became effective July 1, 1972. Prohibited manufacture, sale or use of any paint or coating with more than 0.5 percent lead on any "toys, children's furniture, interior surface of any dwelling, or any other surface easily accessible to children under the age of 7 years" unless application for exemption and documentation filed. Kentucky law provides for reduction in lead level to .06 percent on January 1, 1974.

c. Massachusetts law (H.B. 6266), approved November 15, 1971 prohibits sale of lead-based paints (more than 0.5 percent) after January 1, 1973. Covers "interior or exterior surfaces or fixture of any dwelling, "and exemptions can be granted only by an advisory committee of nine members, which must include four doctors and two parents. Also includes restrictions on sale of houses where lead-based paint exists.

3. Cities

a. Chicago -- two ordinances became effective on July 1, 1972 in spite of action in Federal court. One ordinance prohibits sale of interior paints (with more than .06 percent lead) after July 1, 1972.

b. Columbus, Ohio -- ordinance, effective August 30, 1972, bans "sale, use, or application of lead-based coatings (defined as one-percent) on any exposed surface, interior or exterior, of any dwelling or dwelling unit." Coverage also extends to coatings intended for use on "fixtures or other objects used, installed or located in or upon any exposed surface of any dwelling or dwelling unit"

c. Chattanooga, Tennessee -- ordinance (#6494) effective October 3, 1972 -- restricts the use of and requires labeling for paints containing more than 0.5 percent lead; also prohibits sale of "toys and furniture" to which such paint has been applied.

d. Detroit has ordinance pending which, as presently drafted, would parallel the Chicago ordinance, as to lead content, scope and labeling. However, Detroit officials have invited industry comments and have promised public hearings.

e. Charter, Pennsylvania is preparing "to develop a Lead Poisoning Ordinance and Regulation and a Proposed Lead Poisoning Program."

4. Canada and Great Britain

A prospective amendment to the Canadian Hazardous Products Act will provide a maximum lead level of 1.5 percent for the production of all interior finishes after January 1, 1973. This level will be reduced to 0.5 percent effective on or about January 1, 1974.

Great Britain presently allows 1 percent, with a tolerance of + .3 percent, for paints intended for surfaces which might be chewed by children. They also establish a .3 percent standard specifically for toys.

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3. CLASSIFICATION OF HAZARDOUS MATERIALS

The Hazardous Material Regulation Board, U. S. Department of Transportation, and Occupational Safety and Health Administration, U. S. Department of Labor, both published -- in the Federal Register of June 15, 1972 (at pps. 11898 - 11903) -- proposals for regulatory changes in re definitions of flammable and combustible liquids and related test methods. The announced objective was to achieve uniformity "to facilitate the proper identification, classification and control of flammable and combustible liquids in places of employment and in transportation."

1. The DOT proposal would define a flammable liquid as any liquid having a flash point below 100°F. (37.8°C.). A combustible liquid would mean any liquid having a flash point at or above 100°F. and below 200°F. (93.3°C.). "Pyrophoric" liquids also are included. These are defined as any liquid that ignites spontaneously in dry or moist air at or below 130°F. (54.5°C.). The Pennky-Martens Closed Tester (ASTM D 93-71) is prescribed for liquids containing suspended solids; the Tag Closed Tester (ASTM D 56-70) for others.

2. The DOT proposal would change Occupational Safety and Health Standards (Sections 1910.106 and 1910.108) to be consistent with 1. above.

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Particularly for city children where dangerously high blood lead levels are now being found.

In a sense, there is nothing new about the penetration of lead into our environment since lead has been used technically since Roman times. Like other adverse environmental factors however, there has been a sharp increase in background content in recent times—mainly attributable to the motor car and its use of leaded petrol. Legislation to phase out or phase down the amount of tetra-ethyl lead in motor fuels has been enacted in other countries and recently it has been announced by Mr Peter Walker, that the UK is to do likewise over the next few years.

White lead was the main white pigment in paint for centuries but titanium dioxide has now usurped that position. So, by and large, paints can be made today without lead, or at most innocuously small amounts. But we still have a legacy of old lead paint on buildings and the worse the housing conditions the greater the chance of toxic lead hazard.

In the last year or so in the USA there has been massive publicity that tens of thousands of children are poisoned annually by the lead in old flaking paint. And in some places such as Newark, the local board of health now has powers to require landlords to remove existing lead paint from dwellings!

Safety margin

For young children, there appears to be no real safety margin in view of the high background levels of lead in the environment generally. They get lead from food, drink and air. Under such conditions, the additional hazard of children chewing flakes of paint that could contain lead in a form that would react with their physiology appears to be unarguable. Most stringent of the regulations have regard to the total lead content of inhaled or injected material although, of course, the lead can be present in different forms, of varying solubility in gastric juices etc. and it is reasonable to argue that some lead components of paint may be so encapsulated with resin or polymerised oil that the lead does not react with the physiological system.

The US paint industry set a voluntary standard specifying a maximum of 1.0 per cent lead in paint for use on children's toys, furniture or interior surfaces but, unfortunately for those that contended that it was only old paint that was responsible for potentially hazardous situations, a New York City Bureau of Lead Poisoning Control survey showed that 16 out of 76 retailed products contained more than 1 per cent lead and did not carry the

required cautionary label.

In the UK we have the Children's Toys Regulations limiting lead to 0.5 per cent total on the dried paint film and this might be said to have been echoed in a proposal of the Food and Drugs Administration that special warning statements be required for paint containing more than 0.5 per cent lead, calculated on the weight of contained solids or dried paint film.

A Lead-based Paint Poison Prevention Act, made law in February 1971, prohibits the use of lead paint on surfaces accessible to children in Federal or Federal-assisted dwellings. A Massachusetts law, banning the use of lead-based paints containing more than 0.5 per cent lead will take effect from January 1 1973.

However, this apparent consensus of 0.5 per cent lead is not the end of the story. Moves were set afoot by a committee headed by Senator Edward Kennedy with technical assistance of the American Academy of Pediatrics and FDA to limit lead in paint to 0.06 per cent.

This new limit was reportedly based on feeding tests on adult humans and is stated to have indicated that 40 micrograms of lead per 100 ml of blood is an upper limit because at this level, amino laevulinic acid (ALA) increased markedly. ALA is involved in haemoglobin production and the fact that it appeared in the urine was taken as evidence that it had become unused in its proper haemoglobin production function because of enzyme blocking by lead. From this it was considered that the permissible intake of lead daily by a child should be limited to 300 micrograms, that half of this (150 micrograms) will normally be taken into the child from food, drink and air leaving only another 150 micrograms "for indulging in lead paint ingestion". Inorganic lead salts were used in the feeding tests (with adult not child subjects) so the vexed question remains of relating such tests with lead-containing pigments or lead driers in paint films. Appropriate representations are being made by the US paint industry, but as the matter appears to stand at present there are FDA regulations requiring 0.5 per cent maximum by December 31 1971 and 0.06 per cent by 1973.

Mercury

Public concern ensued following findings of mercury concentration in fish in Japan, USA and other places.

Mineralogically, mercury is not a widely distributed element and deposits yielding more than 1 per cent are rare. The Earth now apparently has a widespread average content of about 0.04 ppm. The US Public Health Service has set a value of 0.0005 ppm

maximum for drinking water.

Food cycle chain concentration of mercury occurs in eco-systems and far reaching ecological consequences of use of mercurials in agriculture appear to be fairly generally accepted although alternatives to their use is still a debatable matter.

As reported to President Nixon in February 1971 by the National Pollution Control Council: "mercury is used by the paint and varnish industry to meet marine and other requirements for anti-fouling paints for ships and for mildew-proofing paint because of its ability to prevent or slow down undesirable growths". Following a finding that mudflats around marinas in Massachusetts contained 950 ppm of mercury caused by mercury-containing anti-foulants, any use of mercury containing anti-foulants was banned by local law.

Immediate ban

In March, this year, the EPA announced an immediate ban on interstate shipments of 32 of the most toxic mercury-containing biocides and on their application, *inter alia* to anti-fouling paints for boats. It has been estimated that 786,000 pounds of mercury had been used annually in the USA in paints. One repercussion has been an unprecedented fall in the price of mercury.

The commonest mercury-containing biocides used in paint are organomercurials. It had been thought that some distinction would be drawn between the alkyl mercurials used in agriculture and the phenyl mercurials used by the paint industry but this apparently no longer holds following the decision in the Great Lakes biochemical case.

The FDA have proposed that a special warning statement should be required for paints containing more than 0.05 per cent of mercury. In EEC countries, the law requires paints containing mercurial fungicides to be identified with a skull and crossbone label.

We must expect that there will be limits for other potentially toxic trace elements and already it has been proposed by the FDA that specific warnings be required for paints containing more than 0.05 per cent (500 ppm) arsenic, cadmium, selenium, individually or in total, calculated on the weight of contained solids or dried paint film. The UK Toy Paint regulations limit to 250 ppm arsenic and soluble antimony, barium, cadmium and chromium.

The National Paint and Coatings Association is reportedly initiating a research study on the toxicity of an even wider range (25) of industrial

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of the monograph concludes with a discussion of the polymer and plasticiser together—their processing, formulation, testing (including a comprehensive table of British Standards) and analysis.

Finally there are three chapters on the nature, structure and application of fillers.

Convertible Coatings, 2nd edition, *Paint Technology Manuals Part 3*, Published on behalf of the OCCA by Chapman and Hall, 350 pp, £2.80.

After a general introductory discussion there follow several chapters on raw materials for coatings including conventional coatings based on drying oils, consideration of oleoresinous varnishes and of methods of testing these films. The more recent, but now extensively used, materials are then introduced, among them alkyd, amino, epoxide, polyester and polyamide resins. A consideration of silicones brings this section of the book to a close. The remainder of the work is devoted to pigmented convertible coatings. There is an account of the composition, properties and methods of dispersing pigments in these coatings, and this is followed by a description of decorative and water paints and industrial finishes. The book closes with a chapter on the technology of emulsion polymerisation.

Metric Conversion Card, US National Bureau of Standards Special Publication 365, 10 cents each, \$6.25 per 100 + 25% for p+p.

The use of the metric system of measurement is increasing in the United States. This plastic metric conversion pocket card, which contains the minimum data needed for such conversions, gives the factors for converting from customary to metric units of length, area, volume, mass (weight), and temperature. The other side gives the corresponding conversion factors for going from metric to customary.

Marketing guide to the Paint Industry (in the USA), 3rd edition, edited by Patricia Noble, Charles H Kline & Co (USA).

Provides a single volume source of marketing, economic and company data previously available only from scattered sources.

Plywood, its Manufacture and Uses. Timber Research and Development Assn, 44 pp, 30p.

This contains a great deal of information on the manufacture, bonding and structural uses of the material as well as chapters on decorative veneers, finishes, protective and fire retardant treatments.

Paint Manufacture—November 1972

Literature

Zirconium chemicals and magnesium powders. A leaflet published by The British Aluminium Company's Chemical Division presents the extensive development work carried out in these fields by Magnesium Elektron Ltd, a subsidiary, who are the world's largest manufacturer of a wide range of zirconium chemicals.

Formaldehyde is the subject of a leaflet from Joseph Crosfield & Sons. This chemical can be used as a raw material for the production of resins, other chemical intermediates, a tanning agent and stiffening agent. *Review of Progress in Coloration and Related Topics*, Volume 3, has been published by The Society of Dyers and Colourists, PO Box 244, Bradford 1, Yorks.

Anderman & Co have recently published a new price list of Merck Reagents for Amino Acid Analysis.

Prinxel CRL—a liquid preservative for aqueous systems (leaflet D 1204) and for metal working fluids (leaflet D 1273)—is detailed in technical information publications from ICI.

The 1972 edition of the Merck General Catalogue of chemicals is available from Anderman & Co Ltd.

Strapping and tying systems from Pakord are featured in a series of A4 leaflets describing the four major Pakord strapping materials—Hyplex plastic strapping, Pakord high tenacity rayon strapping, Tytype, a hand-tying material, and Tycord, a synthetic string for both manual and automatic tying.

International Red Hand Marine Coatings Cut Escalating Costs is the title of a loose-leaf brochure emphasising the use of Latenac high build chlorinated rubber scheme as an economic, universal marine coating. Information sheets give specifications on the use of the scheme for both new construction and vessels in service, feature the application of Latenac on different types of ships, including container ships, tankers, bulk carriers and car-passenger ferries.

Spray booths and low-bake ovens for vehicle and industrial painting requirements are the subject of a leaflet from Federal Engineering (Essex) Ltd. There are drawings showing four types of layout, supported by photographs of an installation.

A ten page publication from Aeronca Winslow Filters describes their recently introduced range of APT filters and PTFE filter elements. APT filter units contain PTFE filter elements with a high resistance to chemical action, low coefficient of friction and self lubricating and non-stick characteristics.

Suitable for almost all types of low and high viscosity liquids a distinct advantage is given in application in which filter aids are normally used as the PTFE elements do not require 'pre-coat'. Operating costs and down time are reduced and re-circulation is not necessary.

The Scope of the Metal Box Company is the title of a booklet providing a comprehensive account of the whole of the company's activities. A loose-leaf section which can be brought up-to-date periodically illustrates the full range of packaging supplied to customer industries.

Coates bulletin for printers, Inklings 82, carries three articles of everyday importance to printers. The first describes the technique, problems and requirements of ink colour matching and the comparison with matching other colouring materials. The other articles cover a new method of estimating flexographic and gravure ink consumption—with the acronym SPANKERS—and a study of the characteristics which effect the paper/ink relationship.

The Environment and Paint

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metals and their compounds used by the paint industry and which will involve solubility studies in gastric juices and animal feeding tests with dried paint films. A seminar on Effects of Current Government Legislation and Regulations on the paint industry was part of the 50th Anniversary Annual Meeting of the Federation of Societies for Paint Technology in Atlantic City in October where 'up-to-the-last-minute' discussion took place of current government actions to limit the content of lead, mercury and other heavy metals in paints. □

Reading list

- Barbara Ward and René Duhos. Only One Earth. An unofficial report commissioned by the Secretary-General of the United Nations Conference on the Human Environment (Andre Deutsch, London 1972).
- D. H. Meadows et al. Limits to Growth. A report for the Club of Rome (Earth Island, London 1972).
- Barry Commoner. The Closing Circle (Jonathan Cape, London 1972).
- H. J. Plenderleith. The Conservation of Antiquities and Works of Art (OUP, London 1956).
- J. A. Kerr et al. Mechanism of photochemical smog formation. *Chemistry in Britain*, 1972, 166, 252.
- D. Bryce Smith. Behavioural effects of lead and other heavy metal pollutants. *ibid.* 260.
- Consumer Protection. The Toys (Safety) Regulations 1967, Statutory Instrument No 1157 (HMSO, London).
- County of Los Angeles. Air Pollution Control District. Rule 66—Organic Solvents; Rule 66.1—Architectural Coatings; Rule 66.2—Disposal and Evaporation of Solvents. June 15 1966.
- City of New York. Air Pollution Control Code Local Law No 49, August 25 1971; Air Pollution Control Code, July 1 1972.
- US Federal Air Pollution Public Law 91-695.
- Order of EPA Administrator to Great Lakes Biochemical. Federal Register, October 19 1971.

The author is a consultant to the Paint Research Association.

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