

**SAY NO TO  
DENTAL  
MERCURY  
NOW**

**SAY NO TO  
MERCURY**

**TEN REASONS  
PHASE OUT  
DENTAL  
AMALGAM  
NOW**

**DR LISA MATRISTE**

# REASON 1 / Dental amalgam has the highest concentration of mercury of all mercury added products listed in Article 4, Annex A

## Composition of dental amalgam



50-54% Liquid mercury

35% Silver

9% Tin

6% Copper (non-gamma-2 amalgam fillings  
release 50X mercury)

Zinc trace

# REASON 1 / Dental amalgam has the highest concentration of mercury of all mercury added products listed in Article 4 Annex A

Mercury-added products	Date after which the manufacture, import or export of the product shall not be allowed (phase-out date)
Batteries, except for button zinc silver oxide batteries with a mercury content < 2% and button zinc air batteries with a mercury content < 2%	2020
Switches and relays, except very high accuracy capacitance and loss measurement bridges and high frequency radio frequency switches and relays in monitoring and control instruments with a maximum mercury content of 20 mg per bridge, switch or relay	2020
Compact fluorescent lamps (CFLs) for general lighting purposes that are ≤ 30 watts with a mercury content exceeding 5 mg per lamp burner	2020
Linear fluorescent lamps (LFLs) for general lighting purposes: (a) Triband phosphor < 60 watts with a mercury content exceeding 5 mg per lamp; (b) Halophosphate phosphor ≤ 40 watts with a mercury content exceeding 10 mg per lamp	2020
High pressure mercury vapour lamps (HPMV) for general lighting purposes	2020
Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for electronic displays: (a) short length (≤ 500 mm) with mercury content exceeding 3.5 mg per lamp (b) medium length (> 500 mm and ≤ 1 500 mm) with mercury content exceeding 5 mg per lamp (c) long length (> 1 500 mm) with mercury content exceeding 13 mg per lamp	2020
Cosmetics (with mercury content above 1ppm), including skin lightening soaps and creams, and not including eye area cosmetics where mercury is used as a preservative and no effective and safe substitute preservatives are available <sup>1)</sup>	2020
Pesticides, biocides and topical antiseptics	2020
The following non-electronic measuring devices except non-electronic measuring devices installed in large-scale equipment or those used for high precision measurement, where no suitable mercury-free alternative is available: (a) barometers; (b) hygrometers; (c) manometers; (d) thermometers; (e) sphygmomanometers.	2020



- 304 mg mercury per capsule
- 1 spill



- 736 mg mercury per capsule
- 3 spill

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# REASON 2 / Dental amalgam measures are inadequate

## The cost of managing the millions of mercury contaminated plastic capsules



Over 200 million successful GS-80 restorations have been placed since its release worldwide in 1986 = **100 tonnes of mercury**



Over 30 million successful Lojic+ restorations have been placed since its release worldwide in 1988 = **15 tonnes of mercury**



Over 400 million successful Permite restorations have been placed since its release worldwide in 1975 = **200 tonnes of mercury**

SDI Australia

**Ultraconservative estimate = 315 tonnes of mercury and 630 million plastic capsules**



Mercury-added products	Provisions
Dental amalgam	<p>Measures to be taken by a Party to phase down the use of dental amalgam shall take into account the Party's domestic circumstances and relevant international guidance and shall include two or more of the measures from the following list:</p> <ul style="list-style-type: none"><li>(i) Setting national objectives aiming at dental caries prevention and health promotion, thereby minimizing the need for dental restoration;</li><li>(ii) Setting national objectives aiming at minimizing its use;</li><li>(iii) Promoting the use of cost-effective and clinically effective mercury-free alternatives for dental restoration;</li><li>(iv) Promoting research and development of quality mercury-free materials for dental restoration;</li><li>(v) Encouraging representative professional organizations and dental schools to educate and train dental professionals and students on the use of mercury-free dental restoration alternatives and on promoting best management practices;</li><li>(vi) Discouraging insurance policies and programmes that favour dental amalgam use over mercury-free dental restoration;</li><li>(vii) Encouraging insurance policies and programmes that favour the use of quality alternatives to dental amalgam for dental restoration;</li><li>(viii) Restricting the use of dental amalgam to its encapsulated form;</li><li>(ix) Promoting the use of best environmental practices in dental facilities to reduce releases of mercury and mercury compounds to water and land.</li></ul>

Article 4 Annex A



# REASON 3 / Mercury free alternatives are readily available

All the excuses...



It's cheap

It's strong

It's safe


It's inert

It's easy


It lasts

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# REASON 4 / Mercury free fillings cost less than dental amalgam



## THE REAL €O\$T OF DENTAL MERCURY



March 2012

10 av. René Gobert 1180 Brussels ☎ +32(2) 374 3647 [concorde.ew@base.be](mailto:concorde.ew@base.be)

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# REASON 4 / Mercury free fillings cost less than dental amalgam

## Comparative costings



Description	Metallic 1 Surface Filling	Adhesive 1 Surface Filling
Cost of materials	AU\$2.70	AU\$31
Charge to patient	AU\$150	AU\$169
Profit margin for dentist	98%	82%

Negative externality - cost of health and environmental impact;

Low cost (separators etc): \$60.00

High cost (no separators etc): \$395.00

<b>Societal Profit:</b>	<b>AU-\$247.70</b>	<b>AU\$138</b>
<b>Societal Profit Margin:</b>	<b>-165%</b>	<b>82%</b>

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# REASON 4 / Mercury free fillings cost less than dental amalgam

## The costly legacy of mercury based dentistry

Approximately 40% of General Practitioners provided Metallic Restoration services;

Single surface, AU\$150

Three surface with a pin, AU\$280

Five surface with another pin, AU\$355

Root canal filling, AU\$1500

Crown, AU\$1600

Extraction, AU\$250

Bridge, AU\$4400 → 10 years later → another extraction → 2 implants

Implant, AU\$4000



**Customer lifetime value per tooth = AU\$8,135 – \$16,535**

# REASON 4 / Mercury free fillings cost less than dental amalgam

## The dental amalgam manufacturers position

*Our management is strong and our teams around the world are dedicated, knowledgeable and experienced. **SDI is no longer just an amalgam company and has been evolving to be a well-recognised dental innovator.** We are very motivated and have a solid pathway to long-term sustainable growth.*

September 2018 – SDI

# REASON 5 / Cost benefit to countries by reducing public health burden

## Mercury is a known health hazard

- **Public Health Burden**
- **Global oral health crisis;**
  - Periodontal disease is the leading cause of tooth loss in adults
  - A clear link between loosening of teeth & chronic exposure to mercury

### WHO Statement on Periodontal Disease



**Dr. Yoshihide Hagiwara, developed powdered barley grass as a product to cure his occupationally induced mercury poisoning.**

**Chronic Health Effects:** Inhalation of mercury vapours, dusts or organic vapours, or skin absorption or mercury over long periods can cause mercurialism. Symptoms include tremors, inflammation of mouth and gums, excessive salivation, stomatitis, blue lines on gums, pain and numbness in extremities, weight loss, mental depression, and nervousness. Exposure may aggravate kidney disorders, chronic respiratory disease and nervous system disorders. May cause damage to blood, kidneys, liver, brain, peripheral nervous system, central nervous system.

**SDI pre-dosed amalgam capsules permite, lojic+ & gs-80, MSDS**

**6 - HEALTH HAZARD DATA Acute/Chronic**  
**Routes of Entry:**  
**Skin: Irritant/Sensitizer/Neurotoxin/Nephrotoxin**  
**Acute Exposure:** May cause redness and irritation. **Chronic Exposure:** Possible sensitization, dermatitis and swelling. Mercury may be absorbed through intact skin causing urinary problems  
**Eyes: Irritant**  
**Acute Exposure:** Contact may cause irritation. Mercury is corrosive and may cause corneal injury or burns. **Chronic Exposure:** Mercury may be deposited in the lens of the eye, causing visual disturbances.  
**Inhalation: Irritant/Sensitizer/Nerotoxin**  
**Acute Exposure:** Inhalation of mercury vapor can cause cough, fever, nausea, and vomiting. **Chronic Exposure:** Inhalation of high concentrations mercury vapor over a long period causes mercurialism. Findings are extremely variable & include tremors, salivation, stomatitis, loosening of teeth, blue lines on gums, pain & numbness in extremities.

**Tytin, Precapsulated, MSDS**

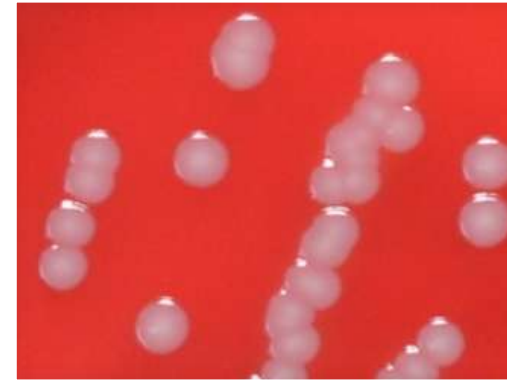
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# REASON 5 / Cost benefit to countries by reducing public health burden

## The connection between dental amalgam and anti-microbial resistance (AMR)

*Installing mercury dental amalgam restorations resulted in an increase in the proportion of their GI tract (oral and faecal) bacteria able to produce volatile Hg(0). 80 to 90 percent of the mercury transforming bacteria were also resistant to several antibiotics because selection for the mercury transformation genes results in co-selection for whatever antibiotic resistances happen to be on the same plasmid; i.e. they are genetically linked.*

Anne O. Summers, Department of Microbiology, The University of Georgia



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# REASON 5 / Cost benefit to countries by reducing public health burden

## Anti-microbial resistance AMR: a global multifaceted phenomenon

- By 2030, antimicrobial resistance could force up to 24 million people into extreme poverty.
- By 2050, 10 million deaths each year and damage to the economy as catastrophic as the 2008-2009 global financial crisis.

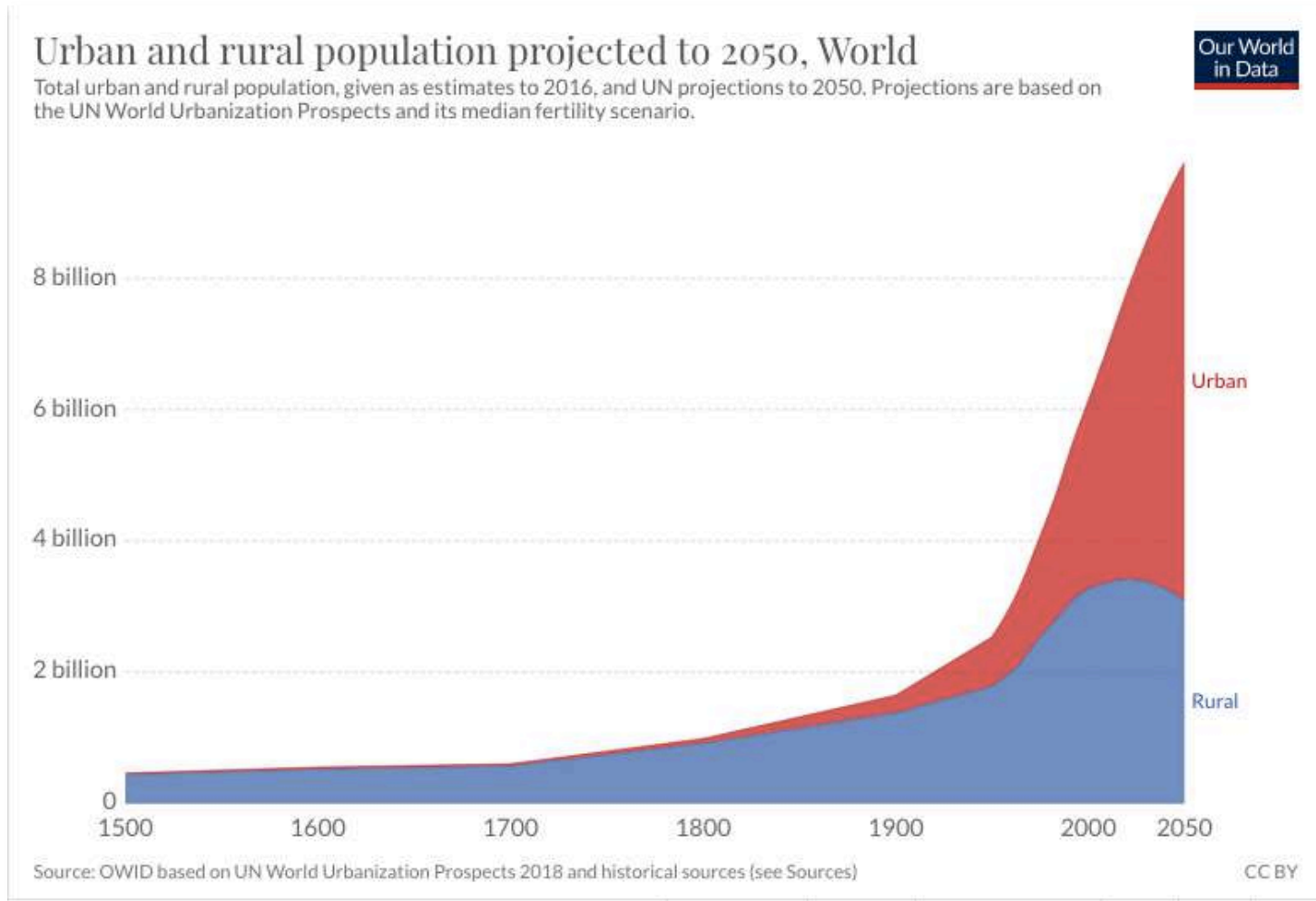
UN Ad hoc Interagency Coordinating Group on Antimicrobial Resistance

- In the US, the CDC estimated the cost of AMR as \$55 billion per year overall
  - \$20 billion in excess for direct healthcare costs, with additional society costs for lost productivity as high as \$35 billion a year.

Francesca Prestinaci, Patrizio Pezzotti, and Annalisa Pantosti, 2015

# REASON 6 / Phase out or phase up

## A growing population means more mercury



By 2050, global population is projected to increase to around 9.8 billion.

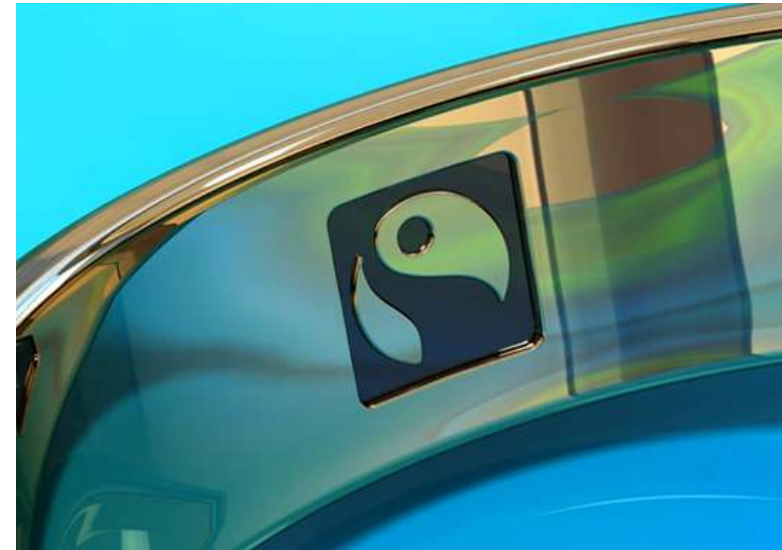
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# REASON 7 / Dental mercury is diverted to ASGM

## The ethical response

For thousands of years, mercury has been used to transform earth into precious metals of gold and silver. Whether it was the ancient practice by alchemists or artisanal miners, gold and silver artifacts have been desired throughout time. The accumulation of these objects have become the measure of one's worth. The trade of gold and silver has been the basis of our currency and the foundation of modern societies' financial sectors. Contemporary gold lust produces both a parallel toxic mercury environmental footprint and transgenerational damage to human health



Fairgold.org



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# REASON 7 / Dental mercury is diverted to ASGM

## The solution and benefits

### The solution

Assign discrete Harmonized System (HS) codes to track transboundary transport of the two forms of dental mercury i.e bulk and encapsulated plus hazardous dental amalgam waste.

### The benefits

- Assist countries in quantifying the use of dental amalgam in their countries as a starting point for a phase down of dental amalgam.
- The other benefit will be to quantify the use that is used legitimately for the dental sector and identify amount that is being illegally diverted toward ASGM
- Tracking the dental amalgam waste so it can end its lifecycle

TABLE 1. TOP 5 EXPORTERS OF MERCURY IN 2017

Top 5 mercury exporters		
Countries	Netweight (kg)	Trade Value (US\$)
Mexico	200,194	\$5,234,522
Japan	71,246	\$2,148,419
Indonesia	69,003	\$1,790,436
Singapore	63,328	\$1,698,820
India	14,403	\$635,211

Source: UN Comtrade database, accessed by 5 October 2018

IPEN



The New York Times, The Hidden Cost of Gold

# REASON 8 / Dental mercury waste management

## Dental Amalgam Manufacturer recommendations for waste disposal

- SDI were found to have contaminated several areas with metallic mercury as a result of poor operational practices. EPA served two clean-up notices and instituted legal proceedings for land pollution against the company

Report of the Environment Protection Authority for the year ended 30 June 1988



### WASTE DISPOSAL:

1. Waste material and all primary containers that have held mercury shall be disposed of following appropriate management practice and in accordance with national regulations, and that all amalgam waste products, including spillage, amalgam residues, particles, fillings, and teeth, or anything contaminated by dental amalgam, is handled and collected by an authorised waste management establishment.
2. Amalgam waste shall never be released, either directly or indirectly, into the environment.

SDI pre-dosed amalgam capsules permite, lojic+ & gs-80, MSDS

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# REASON 8 / Dental mercury waste management

**Current practices of dental amalgam waste management are not adequate**

**Option 1:** Into the bin → landfill or open burning of waste

**Option 2:** Down the sink → waste water

**Option 3:** Into Mediwaste → incineration creates mercury emissions

**Option 4:** Collected or posted in the mail by metal scrap recycler or an authorized recycler

**Where does the recovered dental mercury go?**

**Option 1:** resold as a commodity to dental amalgam manufacturers, chlor-alkali plants, ASGM

**Option 2:** stabilized > final disposal into safe, long-term storage



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# REASON 8 / Dental mercury waste management

## Recovered mercury should not be recycled as a commodity

*Contract Resources have identified an ethical end user within Australia as an end user for the recovered mercury. In the event that demand from this procurer is no longer large enough to keep up with supply or if commercial conditions no longer become viable. **Contract Resources will look to export the recovered mercury overseas.***

EIA

*Moreover, the end product is no longer waste. Instead, processed mercury is sent to Melbourne for use in dental amalgam fillings.*

Woodside



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# REASON 8 / Dental mercury waste management

## Penalties for polluters and phoenixing

*It wasn't until the company collapsed into insolvency six months later, that the warehouse doors were opened to reveal a potential health and environmental disaster on Melbourne's suburban fringe: pallets of steel drums and plastic tubs, stacked to the ceiling, filled with mercury, contaminated powders, leaking batteries, and suspected X-ray machine parts. Almost 800 containers of highly toxic material, abandoned by a company that no longer operated.*

- the estimated clean-up bill was more than \$1 million.

The Age



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# REASON 9 / Social inequalities and injustice

## Socio-Economic Inequality

Dumping dental amalgam disguised as humanitarian dental projects.



**The Balibo Project, East Timor  
Dr Lisa Matriste & Rotary  
International**



**Mercury-free Philippines—One  
dentist is making a difference,  
Dr Lillian Lasaten-Ebuen**



**Africa Mercy Ship,  
in partnership with Saremco, a  
biocompatible & mercury free  
dental manufacturer**

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# REASON 9 / Social inequalities and injustice

## Dental amalgam manufacturers target populations of low socio-economic status

Sales of Amalgam products Amalgam sales currently represent approximately 22.8% of total sales and continues to show a decreasing sales trend as markets are moving to Aesthetic products. **SDI has existing strategies and controls in place to increase its focus on replacement products, but also to continue to promote its Amalgam products to lower socio-economic markets.**

30 June 2019 - SDI Limited Directors' report

# REASON 9 / Social inequalities and injustice

## Gender & age discrimination

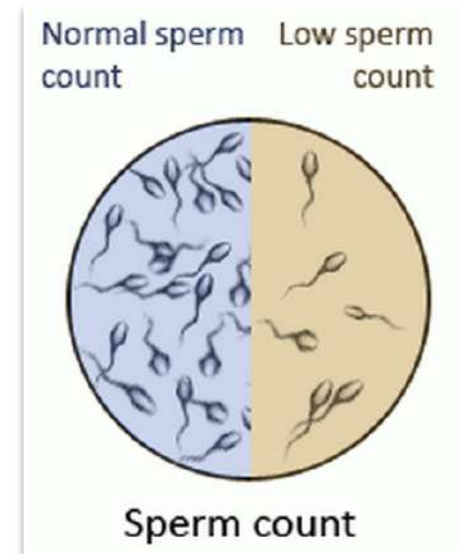
Introduction of a European Union directive;

*Amalgam should not be used in the treatment of deciduous teeth, in children under 15 years old, and in pregnant or breastfeeding women, unless it is deemed strictly necessary by a dentist based on the specific medical needs of the patient*

**If you're not a child or a pregnant or breast feeding mother you are being discriminated against by dental regulation and recommendations.**

**Mercury is a documented reproductive and developmental toxin in humans.**

- Some of mercury's documented hormonal effects at very low levels of exposure include;
  - effects on the reproductive system resulting in lowered sperm counts
  - defective sperm cells
  - and lowered testosterone levels in males.



# REASON 9 / Social inequalities and injustice

Workers rights

**What do these women  
have in common?**



# REASON 9 / Social inequalities and injustice

Workers rights

**We are both innocent victims of Mercury poisoning.**



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# REASON 9 / Social inequalities and injustice

## Workers rights

### 8. Work activities that may represent a high risk exposure

Mercury exists in three forms: liquid and vapour states ( $\text{Hg}^0$ ) and inorganic mercury salts ( $\text{Hg}^{1+}$  and  $\text{Hg}^{2+}$ ).

Examples of work activities involving inorganic mercury and its compounds which require special attention when assessing exposure include:

- manufacture of amalgams, for example tin amalgam, amalgam of gold, copper and zinc used in dentistry for filling teeth, amalgamated zinc used in electric batteries and sodium amalgam used in the laboratory in conjunction with water as a reducing agent
- dental work involving mercury
- manufacture of pigments and antifouling paints (mercuric oxide) and vermilion (mercuric sulphide) in the paint and colour industry
- extraction of gold and silver from roasted pyrites (mercuric sulphate)
- extraction of gold from tailings
- laboratory work with mercury in closed or confined spaces
- the use of mercury-containing fungicides
- exploration/production, refining and processing of natural gas
- the use of fluorescent lamps and electrical meters.

Special attention should be given to acute exposures, including mercury spills that may occur in the above processes.

*It is recommended testing should occur one month, three months, six months and thereafter at regular intervals*


**Hazardous Chemicals Requiring Health Monitoring Guide, SafeWork**

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# REASON 9 / Social inequalities and injustice

## Workers rights – Introducing the SMART protocol

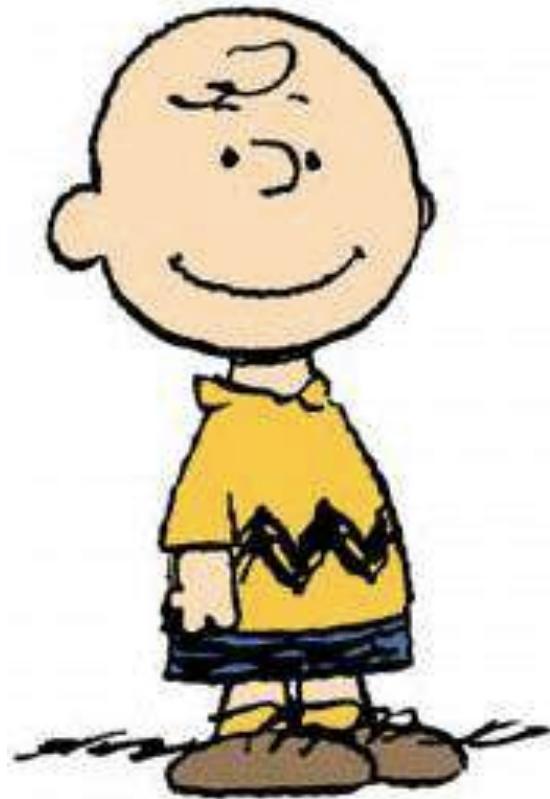
Personal protection	
Eye and face protection	<ul style="list-style-type: none"><li>▶ Safety glasses with side shields.</li><li>▶ Chemical goggles.</li><li>▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate chemicals in use and an account of injury experience. Medical and first-aid personnel should be readily available. In the event of chemical exposure, begin eye irrigation immediately and reinsert lenses at the first signs of eye redness or irritation - lens should be removed in a clean environment. [Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent]</li></ul>
Skin protection	See Hand protection below
Hands/feet protection	Wear impervious gloves.
Body protection	See Other protection below
Other protection	<ul style="list-style-type: none"><li>▶ Overalls.</li><li>▶ PVC Apron.</li><li>▶ PVC protective suit may be required if exposure severe.</li><li>▶ Eyewash unit.</li><li>▶ Ensure there is ready access to a safety shower.</li></ul>



SDI pre-dosed amalgam capsules permite, lojic+ & gs-80, MSDS

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# REASON 10 / Charlie Brown is getting old



# A ROAD MAP TO END THE MERCURY AGE IN DENTISTRY

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## Source Reduction

- Switch to alternatives
- Support the African Amendment to Annex A for the universal phase out of dental amalgam by 2024
- Support the Review of Annex A and B

## Dental Mercury Waste Management

- Government development of regulation for programs for mandatory installation of BAT dental amalgam separators.
- Government development of regulation for mandatory programs for installation of BAT to capture mercury emissions in dental clinics and crematoria
- Allocate discrete HS codes to dental amalgam and dental amalgam waste
  - Dental amalgam waste must be processed locally and not transported over water bodies

## Recovery, stabilization and final disposal of dental mercury

## Awareness Raising, Capacity Building and Technical Assistance

- Implementing reforms in dental profession to include occupational and environmental protection.
- Government development of regulation for making SMART protocol mandatory and integrat within University curriculum.

# **SAY NO TO DENTAL MERCURY NOW**

**For follow up and  
access to source  
documents come and  
visit us at our booth**



**[contact@saynotomercury.com](mailto:contact@saynotomercury.com)**

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