

# Do you want your receipt? BPA and BPS in thermal paper

**Madalyn Cioci**  
Waste and Pollution Prevention Specialist

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Minnesota Pollution Control Agency

# The MPCA...

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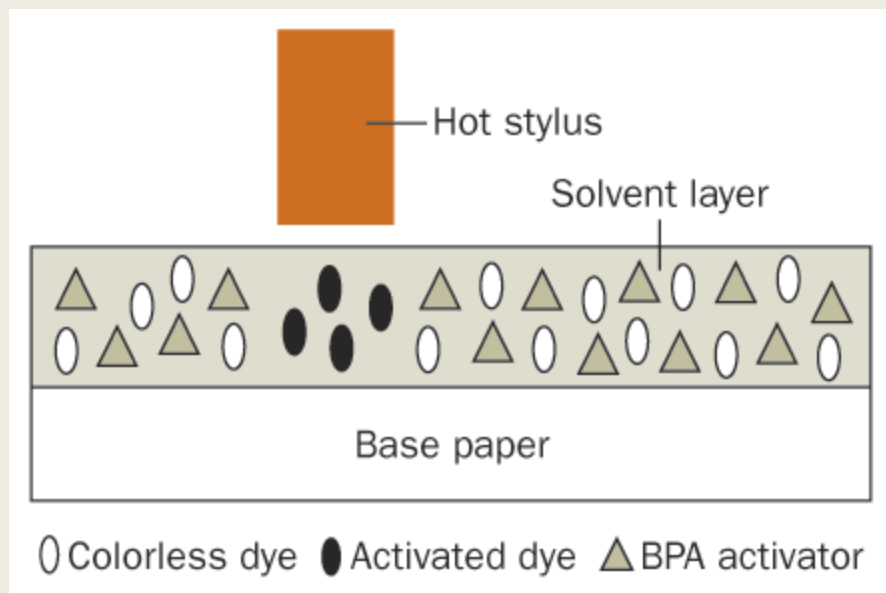
Working to protect and improve our environment and enhance human health.



# BPA on thermal paper in the news



# How does thermal paper work?



Science News



# Is it thermal paper or bond paper?

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# Project approach

- ❑ EPA Grant
- ❑ Hospitality sector
- ❑ Tested papers
- ❑ Assistance with switch to digital receipts
- ❑ Exploration of other strategies
- ❑ Voluntary, pollution prevention approach



# Why not regulate “BPA-free”?

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“To every problem there is a solution that is simple, clean, and wrong.” -HL Menken

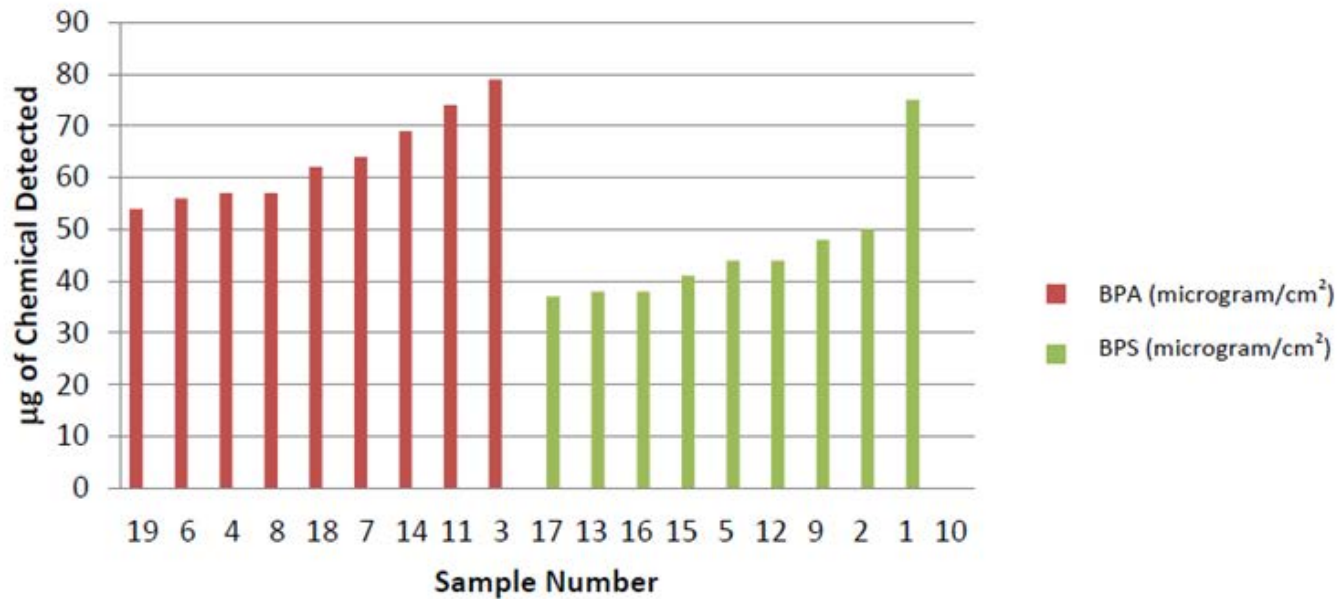
- ❑ Regrettable substitutions
- ❑ “BPA-free” does not mean “safer”





# Meet the cousin

## Micrograms per cm<sup>2</sup> of BPA and BPS in tested samples of thermal paper







## BISPHENOL A ALTERNATIVES IN THERMAL PAPER

hazards. For most endpoints, the criteria define “High,” “Moderate,” and “Low” concern. Very few chemicals had measured data for all endpoints; therefore, estimation methods were applied to fill data gaps. Since estimation methods come with a lower degree of confidence, this circumstance may be an important consideration for decision-making. No clearly safer alternatives to BPA were identified in this report – most alternatives have Moderate or High hazard designations for human health or aquatic toxicity endpoints. Persistence and bioaccumulation potential were not distinguishing for this group of alternatives.



# Bisphenol A (BPA)

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- ❑ 13.5 billion pounds per year globally
- ❑ Used in polycarbonate plastic, epoxy resins, specialty coatings
- ❑ Present in almost all of us
- ❑ Present in Minnesota surface waters
- ❑ Degrades quickly, but is “pseudo-persistent”.



# BPA impacts

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- ❑ Affects health of humans and aquatic life.
- ❑ Endocrine active – mimics estrogen.
- ❑ Linked to obesity, proliferation of breast cancer cells, attention and other developmental issues, early onset of puberty.
- ❑ In aquatic species, reduces ability to reproduce (ex. feminization of males.)



# BPA

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- ❑ Minnesota Priority Chemical
- ❑ California Prop 65 list as female toxicant (2015)
- ❑ EPA considering rulemaking to add BPA to Concern List: unreasonable risk of injury to the environment.





# What we know

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- ❑ Cashiers have more BPA in blood and urine.
- ❑ Unbound on receipts, 1-2% by weight
- ❑ Easily transferred to skin and absorbed.
- ❑ Transfer and uptake are facilitated by moisture, alcohol sanitizers, lotions, grease.
- ❑ 10-60% of BPA on hands will be absorbed.
- ❑ Less chemical on unprinted side





# What we don't know

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- Dose and timing interactions
  - Low dose vs. higher doses
  - Accumulated doses
  - Dose timing









# Alternatives and actions?





**LINDEN HILLS**  
**CO-OP**  
**GROCERY & DELI**

**Jolene Parker**  
Customer Service  
Manager

Linden Hills Co-op  
Minneapolis, MN

612-922-1159 store  
612-279-2470 office



# Steps employees can take

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- ❑ Minimize handling of thermal receipts.
  - Minimize friction/wipe action, crumpling
  - Handle with just two fingers
  - Minimize grip pressure
  - No moisture, grease, lotion, alcohol-based cleaners
  - Fold printed side in
  - Wash hands before eating



# Steps businesses can take

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- Ask “Do you want your receipt?” don’t print unwanted receipts (8-37% reduction)
- Don’t print merchant copies if kept electronically (~50% reduction)
- Switch to e-receipt system (18 - 90% reduction)
- Shorten receipts (paper reduction but no occupational exposure reduction)
- Double-sided thermal paper (no chemical reduction; 40-50% less paper)
- Switch to a non-phenol paper (99.9% chemical reduction; little or no paper reduction)



# Small retail results

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- ❑ 8 businesses:
  - 7,300 pounds of paper
  - 109 pounds of BPA/BPS reduced
  - 10-30% reduction
- ❑ 14 additional project partners could reduce
  - 1,052 – 3,155 pounds of paper
  - 12-36 pounds of chemical use





# Large retail and beyond

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- ❑ Best Buy – over 7,000 lbs chemical reduction with change in paper
  
- ❑ MPCA estimates  
US thermal paper use ~146,000 tons annually.  
10-30% paper reduction:
  - 14,600 – 43,800 tons less paper
  - 219-657 tons less endocrine-active chemical use



There is potential for pollution prevention through active promotion of strategies for using less thermal receipt paper







## Toolkit

FAQs

Videos

Strategies

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### BPA in thermal paper

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## BPA in thermal receipt paper

The MPCA encourages Minnesota businesses to voluntarily reduce the amount of thermal receipt papers they use and distribute to their customers. These papers typically contain relatively high concentrations of the chemical Bisphenol-A<sup>®</sup> or related chemicals. BPA is useful as a heat-triggered developer for thermal receipt papers used at the point-of-sale in everyday retail outlets. Because of this, the receipts have become an avenue for BPA exposure for all who handle receipts, and a mechanism for spreading BPA through the environment.

While the rate of absorption through the skin and calculating added risk from handling receipts is not completely certain, thermal paper receipts are recognized as a pathway for BPA exposure for people who handle receipts (especially cashiers), and as a mechanism for spreading BPA through the environment.

**If you are a business or employee interested in this issue, check this website regularly for updates, tools and information being developed from this project. If you would like assistance or additional information, please contact Madalyn Cioci, 651-757-2276**

MPCA thanks the U.S. Environmental Protection Agency's Pollution Prevention Program for the grant which supported this project.

### Toolkit

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#### What's the problem with chemicals in receipts?

Bisphenol-A (BPA), a chemical on the Minnesota Department of Health's list of Priority



#### Local business goes paperless

The idea of paperless receipts is catching on, and many businesses are making the change.

Find out more about how [Claddagh Coffee](#) made the switch.



# Thank you!

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Madalyn Cioci

651-757-2276

[madalyn.cioci@state.mn.us](mailto:madalyn.cioci@state.mn.us)

Thermal Paper Project [www.pca.state.mn.us/receipts](http://www.pca.state.mn.us/receipts)

