



# Inadvertent PCBs

Identifying Pigments Made without Chlorine

Presentation to the Spokane River Regional Toxics Task Force

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# The iPCB Pigment Resource

This database was commissioned by the Spokane River Regional Toxics Task Force to help identify possible sources of inadvertent PCBs in pigments. Depending upon the circumstances, some of these pigments may reach water bodies such as the Spokane River.

The purpose of the database is to serve as a resource to help understand which pigments 1) include chlorine in their molecular structure and 2) whether chlorinated solvents are used in the manufacturing process for the pigment.

## LINKS:

1. Home website: <https://www.chemforward.org/ipcb-pigment-resource>
2. The iPCB Pigment Resource: <https://www.chemforward.org/ipcb-pigment-resource-tool>

ChemFORWARD was commissioned to lead this project. The project involved research, software development, data population and curation, and communication and outreach (via website).

ChemFORWARD contracted Dr. Mark Vincent and his colleague Grace Manarang-Pena to perform the research.



SAFE + CIRCULAR + JUST  
INADVERTENT PCB (IPCB) PIGMENT **RESOURCE**

## Website: Background

Polychlorinated biphenyl compounds (PCBs) are a class of chemicals with 209 different congeners depending on the number and location of chlorine atoms on the biphenyl structure. While the deliberate use of PCBs was banned UNDER TSCA in 1976, PCB's that are inadvertently generated during manufacturing are allowed, such as in the production of certain pigments. Selecting pigments that do not contain inadvertently generated PCBs (iPCBs) can improve water quality, the ability to recycle paper and cardboard, and improve a primary food source for tribal communities.

**The iPCB Pigment Resource supports those who procure organic pigments for use in coatings, plastics, printing inks and many other products in identifying alternatives that are not manufactured with chlorinated solvents and/or do not have chlorine in their molecular structure, and are therefore unlikely to contain PCBs inadvertently generated during manufacturing.**

**GO TO iPCB  
PIGMENT  
RESOURCE**

Pigments are ubiquitous in consumer products. Manufactured products and the pigments within them inevitably end up in the environment. Some of these iPCB-containing wastes are diverted to recycling and wastewater treatment facilities. Even with the most advanced, state-of-the-art treatment systems, low levels of iPCBs continue to enter waterways above Washington State's water quality standards.

# WHAT

## A RESOURCE FOR PROCUREMENT PROFESSIONALS

The iPCB Pigment Resource is a free searchable dataset of nearly 400 pigments organized by chemical name, CAS#, color index number, application, availability in the US market, and whether they were manufactured using chlorinated solvents or are organochlorine molecules themselves. The tool can be used to help identify pigments that are unlikely to contain iPCBs.

A review of research has shown that the pigments most likely to contain iPCBs are diarylide yellows and phthalocyanine greens and blues. While the iPCB Pigment Resource does not provide information on performance characteristics or full chemical hazard assessments, it is intended to identify alternative pigments that can be used for the same applications while avoiding iPCBs.

[Constructing The Dataset >>](#)

# WHY

## SUPPLY CHAIN TRANSFORMATION

### ELIMINATING iPCBs IS CRITICAL TO CIRCULARITY AND HUMAN HEALTH

Some PCBs accumulate in the sediments at the bottoms of streams, rivers, lakes and coastal areas. Certain PCBs can build up in the fatty tissues of fish and other animals, and in high concentrations pose serious health risks to people who frequently eat contaminated fish.

Regulations still allow for the presence of “inadvertent” PCBs. Based on TSCA, iPCBs are allowed at an average concentration of 25 parts per million (ppm) with an upper bound limit not to exceed a maximum of 50 ppm 25ppm.

To reduce iPCBs in products and attain State of Washington’s water quality standards, policy makers are pursuing both beginning-of-life and end-of-life solutions. One beginning-of-life action is to reduce iPCBs in supply chains, specifically by implementing procurement policies that focus on certain pigments used in some products. The purpose of this project is to develop a resource in the form of a comprehensive list of pigments that are unlikely to contain iPCBs based on their manufacturing process and molecular structure.

## Website: Background



WHO

This database was commissioned by the Spokane River Regional Toxics Task Force to help identify possible sources of inadvertent PCBs in pigments, with the goal of reducing the levels of iPCBs in the Spokane River and beyond.

Research was performed by, Dr. Mark Vincent and Grace Manarang-Pena.

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# THE DATASET

## HOW THE DATASET WAS COMPILED

Research was performed by, Dr. Mark Vincent and Grace Manarang-Pena, to identify pigments used in coatings, plastics, and printing inks. The pigments were identified by color index number, CAS number, chemical structure, and:

1. whether or not they contain chlorine in their molecular structure, and
2. whether or not chlorinated solvents and auxiliaries were likely used to produce them.

The resource also indicates whether or not the pigment is globally commercially available.



## REFERENCES

1. Colour Index
2. **K. Hunger and W. Herbst. 2004. "Industrial Organic Pigments: Production, Properties, Applications" 3rd Edition**
3. State Environmental Heads Pass Resolution about PCBs. ECOS Resolution Update. September 4, 2012. Huffington Post.
4. MADE SAFE Banned List: Polychlorinated biphenyls (containing 60 or more percent chlorine by molecular weight)
5. PCB's and their Inadvertent Presence in Pigments – Presentation by Mark Vincent of Dominion Colour to the SRRTTF.
6. Interstate Chemicals Clearinghouse (IC2),
7. Pigments and inadvertent polychlorinated biphenyls (iPCBs): Advancing no and low iPCB pigments for newsprint, and paper and paperboard packaging

# The Web-based Resource



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## INADVERTENT PCB (IPCB) PIGMENT **RESOURCE**

**The iPCB Pigments Resource is a free searchable dataset of nearly 400 pigments organized by chemical name, CAS#, color, and presence of chlorine. The tool can be used to find alternatives by avoiding those containing or manufactured with chlorine and thus reducing the likelihood of containing iPCBs.**

*NOTE: The use or presence of chlorine in a pigment or in the pigment manufacturing process does not definitively determine that inadvertent PCBs are present in a pigment. Manufacturing process changes regularly occur, and current information can be obtained by contacting the pigment manufacturer directly. While it is known that some pigments can contain inadvertent PCBs, such as diarylide yellow, it may not be true for all suppliers of it or other pigments that contain chlorine or could be made with chlorinated solvents.*

# The Web-based Resource: An Air Table

Hide fields Filter Sort ...

CAS NO.	COLOR CLASS	PIGMENT CLASS	COATINGS?	INKS?	PLASTICS?	COMMERCIAL AVAILABI...	CONTAINS CHLORINE?	MANUFACTURED USIN
<b>Pigment Yellow 1</b> 2512-29-0	Yellow	Monoazo	Yes	No	No	Yes	No	No
<b>Pigment Yellow 1:1</b> 12240-03-8	Yellow	Monoazo	Yes	Yes	No	No	No	No
<b>Pigment Yellow 2</b> 6486-26-6	Yellow	Monoazo	Yes	Yes	No	No	Yes	No
<b>Pigment Yellow 3</b> 6486-23-3	Yellow	Monoazo	Yes	No	No	Yes	Yes	No
<b>Pigment Yellow 4</b> 1657-16-5	Yellow	Monoazo	No	No	No	No	No	No

# The information can be filtered, sorted and downloaded

Hide fields Filter Sort ...

No sorts applied to this view  
Pick a field to sort by ▾

Find a field

- Colour Index Number
- CAS No.
- Color Class
- Pigment Class
- Coatings?
- Inks?

	PIGMENT CLASS	COATINGS?	INKS?	PLASTICS?	COMMERCIAL AVAILABI...	CONTAINS CHLORINE?	MANUFACTURED USIN	
<b>Pigment Yellow 1</b> CAS NO. 2512-29-0		Yes	No	No	Yes	No	No	
<b>Pigment Yellow 1:1</b> CAS NO. 12240-03-8		Yes	Yes	No	No	No	No	
<b>Pigment Yellow 2</b> CAS NO. 6486-26-6		Yes	Yes	No	No	Yes	No	
<b>Pigment Yellow 3</b> CAS NO. 6486-23-3	COLOR CLASS Yellow	PIGMENT CLASS Monoazo	COATINGS? Yes	INKS? No	PLASTICS? No	COMMERCIAL AVAILABI... Yes	CONTAINS CHLORINE? Yes	MANUFACTURED USIN No
<b>Pigment Yellow 4</b> CAS NO. 1657-16-5	COLOR CLASS Yellow	PIGMENT CLASS Monoazo	COATINGS? No	INKS? No	PLASTICS? No	COMMERCIAL AVAILABI... No	CONTAINS CHLORINE? No	MANUFACTURED USIN No

The information can be filtered, sorted and downloaded

Hide fields Filter Sort ...

**Pigment Yellow**  
CAS NO. 2512-29-0

**Pigment Yellow**  
CAS NO. 12240-03-8

**Pigment Yellow 2**  
CAS NO.

COLOR CLASS PIGMENT CLASS COATINGS? INKS? PLASTICS?

PLASTICS? No

PLASTICS? No

PLASTICS?

In this view, show records

Where Drag conditions here to add them to this group + 🗑️ ⋮

and ▼ Colour Index ... ▼ contains ▼ Enter a value 🗑️ ⋮

+ Add condition + Add condition group ?

The information can be filtered, sorted and downloaded

Hide fields **Filtered by Colour Index Number** Sort ...

CAS NO.	COLOR CLASS	PIGMENT C
2512-29-0	Yellow	Monoazc
Pigment Yellow 1:1		

Download CSV  
Print view

## Next Steps

1. The and webpage are live on the ChemFORWARD website but there are no pointers to it.
2. How would the SRRTTF like to proceed with respect to:
  - a. Hosting the website and resource
  - b. Engaging partners to host the website and resource
  - c. Provide outreach to key stakeholders including US EPA

**Annexes Follow**



# Administrative

Contract for one year was signed with a starting date of 4 February 2022

The project team convened every two weeks to maintain momentum

Updates were provided at the SRRTTF TSCA Workgroup calls

The TSCA Workgroup provided guidance and feedback on the design and functionality.

