Partnerships for Innovative Solutions

Spokane River Regional Toxics Task Force Workshop

October 8-9, 2019, Spokane, WA

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CPMA
Color Pigments Manufacturers Association

About CPMA

- Formed in 1925, the Color Pigments Manufacturers Association is the recognized industry voice for *manufacturers, importers*, *suppliers* and *distributors* in North America.

- Promotes compliance with safety, health and environmental laws and regulations in North America.

- Engages with policy makers, regulators, customer trade associations and value chain stakeholders to address and communicate issues impacting the color pigments industry.

- Provides membership forums for sharing industry best practices to assist members in better serving their shareholders, customers, employees and society.

What are color pigments?

- Pigments are colored, black, white or fluorescent particulate organic or inorganic solids which usually are insoluble in, and essentially physically and chemically unaffected by, the vehicle or substrate in which they are incorporated
- Pigments alter appearance by selective absorption and/or by scattering of light
- Pigments are usually dispersed in vehicles or substrates for application, as for instance in the manufacture or inks, paints, plastics or other polymeric materials
- Pigments retain a crystal or particulate structure throughout the coloration process

(Safe Handling of Color Pigments, Color Pigments Manufacturers Association Inc., First Edition, 1993)

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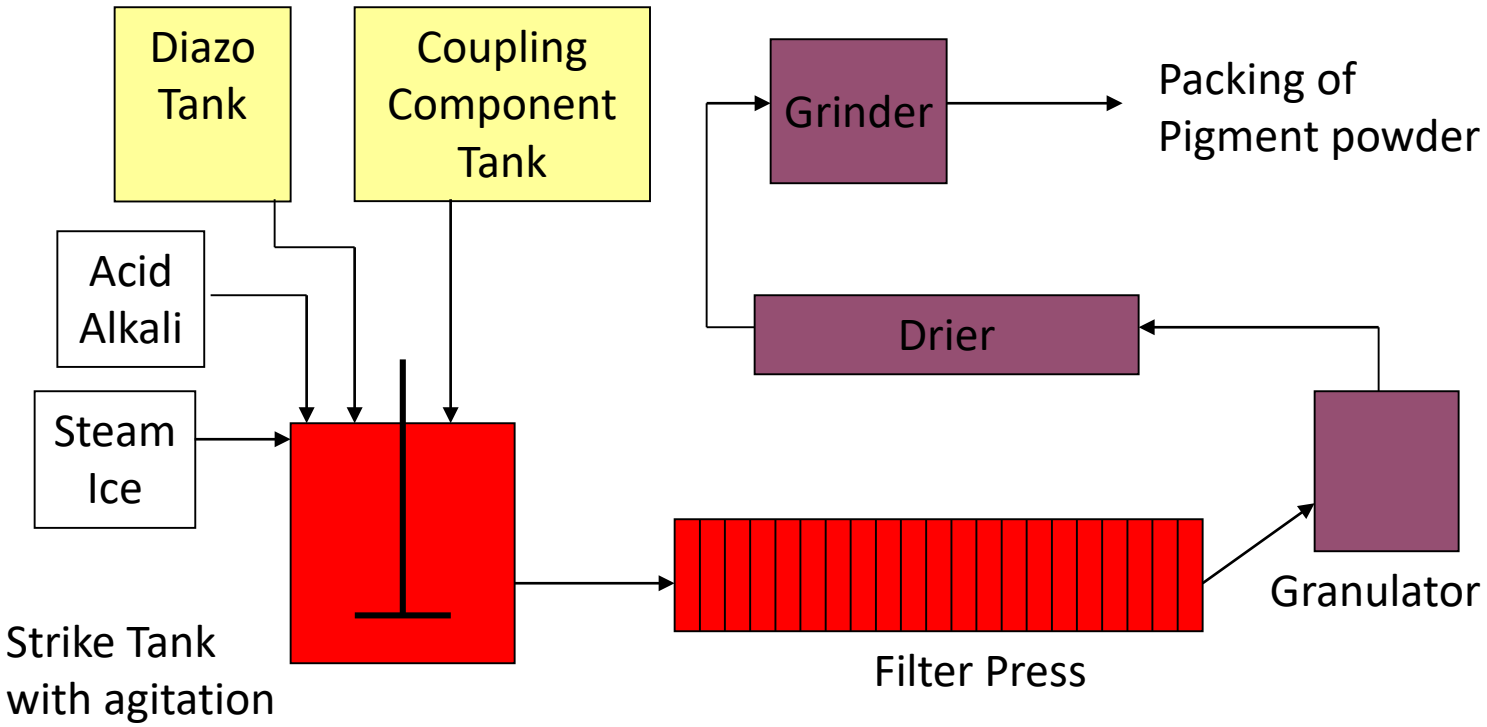
Dye (soluble) vs Pigment (insoluble)

Manufacturing Process



Color Pigments Used in Printing Ink Applications

Digital Printing

- C.I. Pigment Blue 15:x
- C.I. Pigment Red 57:1
- C.I. Pigment Red 122
- C.I. Pigment Violet 19
- C.I. Pigment Yellow 150
- C.I. Pigment Yellow 74
- C.I. Pigment Black 7

Offset Printing

- C.I. Pigment Blue 15:x
- C.I. Pigment Red 57:1
- C.I. Pigment Yellow 13
- C.I. Pigment Black 7
- C.I. Pigment Red 52:1 (primarily in the US)
- C.I. Pigment Yellow 14 (primarily in the US)
- C.I. Pigment Yellow 12 (low cost and lightfastness)

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Color Pigments Used in Printing Ink Applications

Lithographic

- C.I. Pigment Blue 15:x
- C.I. Pigment Red 57:1
- C.I. Pigment Yellow 13
- C.I. Pigment Black 7
- C.I. Pigment Red 52:1 (primarily in the US)
- C.I. Pigment Yellow 14 (primarily in the US)
- C.I. Pigment Yellow 12 (low cost and lightfastness)

Flexographic

- C.I. Pigment Blue 15:x
- C.I. Pigment Red 57:1
- C.I. Pigment Yellow 13
- C.I. Pigment Black 7
- C.I. Pigment Red 52:1 (primarily in the US)
- C.I. Pigment Yellow 14 (primarily in the US)
- C.I. Pigment Yellow 12 (low cost and lightfastness)

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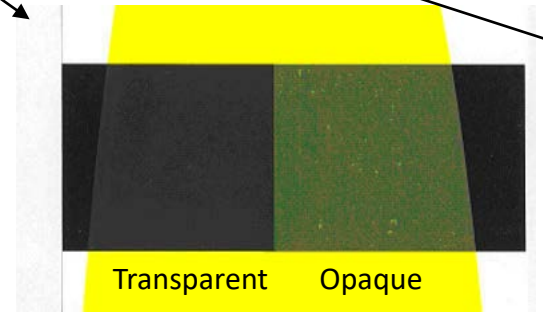
Color Pigments Characteristics & Customer Requirements

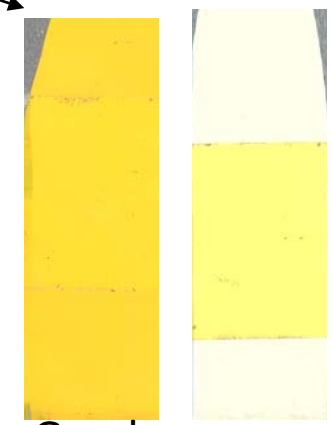
- ✓Chroma
- ✓Broad shade functionality
- ✓Durability/lightfastness
- ✓Opacity/transparency
- ✓Low metamerism
- ✓Dispersibilty
- ✓Heat stability
- ✓Solvent resistance
- ✓Gloss retention
- ✓Color strength

- ✓Fitness for purpose (performance level)
- ✓Regulatory status
- ✓Cost
- ✓Availability



Good Dispersibility

Bad Dispersibility



Good Durability

Poor Durability

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Printing Ink Industry Customer Requirements

- Commercial Applications
- Value Chain Integration
- Technical Specifications
- Manufacturing Cost
- Supply Chain Delivery
- Customer Preferences (Global)

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Color Pigments Regulatory Compliance

- Manufacturing Regulations (EPA, OSHA, ECCC, HC)
- Product Applications (EPA, FDA, CPSC, FIFRA, HC)
- Chemicals Registrations (EPA, ECCC, ECHA, REACH)
- Chemicals Labeling (GHS, Proposition 65, REACH)
- Batch Chemical Processing (CAA, CWA, EPCRA, RCRA, CEPA)

Color Pigments Regulatory Assessment

- ✓2016 Canada Assessment of Monoazo Pigments (No risk to human health or the environment)
- ✓2014 Canada Assessment of Diarylide Pigments (No risk to human health or the environment)
- ✓2010 USEPA Benzidine Dyes Action Plan (No Exposure concern for pigments in printing inks)
- ✓2010 REACH Dossiers for Diarylide Pigments (Safe for intended use)
- ✓2010 REACH Dossiers for Phthalocyanine Pigments (Safe for intended use)
- ✓2005 OECD SIDS Dossiers for Phthalocyanine Pigments (Low hazard)
- ✓2003 OECD SIDS Dossiers for Diarylide Pigments (Low hazard)
- ✓1995 TRI Delisting for Phthalocyanine Pigments (Low hazard)
- ✓1994 OECD SIDS Dossier for Monoazo Pigments (Safe for intended use)

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PCBs & Color Pigments

Perspectives:

- ❑ Industry has not done anything to address inadvertent PCBs
- ❑ It is easy to substitute color pigments in printing ink formulations
- ❑ Pigments and dyes PCB-11 impact at 0.02-31 kg for Washington State
- ❑ 250mm tons (500 billion pounds) or organic pigments produced annually, of which 25% are Diarylides
- ❑ Color pigments from printing inks are the primary source of PCB-11 in Spokane River
- ❑ Product tests identify inadvertent PCBs in packaging and products
- ❑ PPQ WA water discharge permit requirements will greatly improve water quality

Actuality:

- ✓ Industry has modified manufacturing processes and product formulations since 1990's to minimize inadvertent PCBs and ensure compliance with global regulations
- ✓ Each pigment is unique to meet specific technical and application requirements
- ✓ Incorrect calculations and conclusions cited in PCBs related studies
- ✓ Global color pigments production information greatly exaggerated and not substantiated by government trade data
- ✓ Comprehensive studies haven't been conducted to identify all potential sources of PCB-11
- ✓ Product tests reveal inadvertent PCBs levels are significantly below federal regulatory limits
- ✓ PPQ is comparable to background levels in nature, a non-detect level; technology doesn't exist to achieve PPQ

Thank you!

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