Session I.
Learning from GC3 Collaborations to Drive Green Chemistry

11th Annual GC3 Innovators Roundtable

Burlington Hilton
May 24 – 26, 2016

GREEN CHEMISTRY & COMMERCE COUNCIL
Business Mainstreaming Green Chemistry

Session Overview

Moderator: Roger McFadden, McFadden and Associates, LLC

- **GC3 Collaborative Project Examples**
  Monica Becker, GC3
  Sally Edwards, GC3

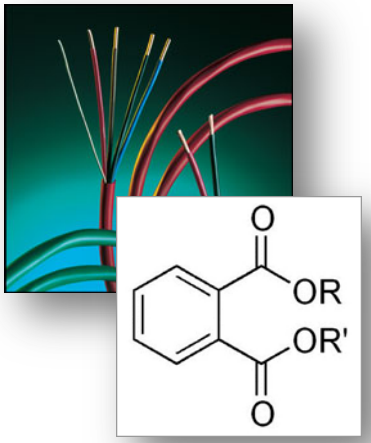
- **Panel Discussion: Lessons for future success**
  Ashley Hall, Walmart
  Eunice Heath, Dow
  Jack Linard, Unilever

- **Audience Q&A/Discussion**

GC3 Collaborative Project Examples

1. Evaluation of alternative plasticizers for wire and cable
2. Accelerating innovation – Preservatives
3. Retailer Leadership Council

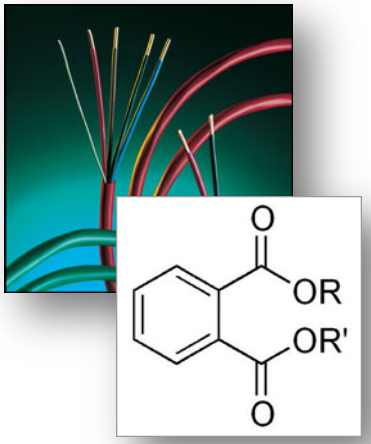
Evaluation of Alternative Plasticizers for Wire and Cable



Project Goals:

- Identify safer alternatives to toxic phthalate plasticizers
- Pool knowledge, funds, and data to get more robust results
- Create a model for future collaboration

Evaluation of Alternative Plasticizers for Wire and Cable



Participants

Manufacturers
Dell
EMC
HP

Plasticizer Suppliers
BASF
Dow
Hallstar

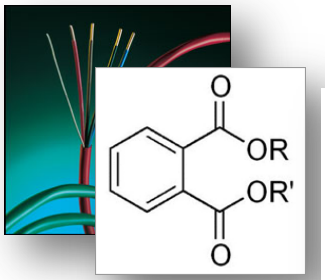
Retailer
Staples

Plastic Compounder
Teknor Apex

Toxicology Consultant
ToxServices

Univ., Gov., NGO
Univ. of Mass. Lowell
Washington State
Clean Production Action
Pacific Northwest PP Resource Ctr

Evaluation of Alternative Plasticizers for Wire & Cable



Chemical Hazard Assessments of Alternative Plasticizers for Wire & Cable Applications

GreenBiz

How collaboration can lead to better decisions on safer chemical alternatives

Monica Becker
Friday, October 26, 2012 - 8:00am

Plasticizer Acronym	Chemical Name	CAS No.
DEHT (Eastman 168)	Di(2-ethylhexyl) terephthalate	6422-86-2
Hexamoll® DINCH® (BASF)	Diisononyl cyclohexanedi carboxylate	166412-78-8 (outside the U.S.), 474919-59-0 (inside the U.S.)
DOZ	Bis(2-ethylhexyl) azelate	103-24-2

http://greenchemistryandcommerce.org/projects/business-and-academic-partnerships-for-safer-chemicals

Accelerating Innovation – Preservatives

Project Goals

To expand the palette of safe and effective preservatives for personal care, household and institutional products

To create a new model of pre-commercial collaboration to accelerate the development and scale of new, safe technologies

Participants To Date

Aubrey Organics

Aveda/Estee Lauder

BabyGanics

Beautycounter

Beiersdorf

Colgate-Palmolive

Environmental Defense Fund (EDF)

Henkel

Johnson & Johnson

L'Oreal

Method

Minn. Green Chemistry

Procter & Gamble

Reckitt Benckiser

Seventh Generation

Staples

Target

Unilever

Walmart

Need Statement & Development Criteria for New Preservatives for Personal Care & Household Products

	GENERAL CRITERIA (For Personal Care, Household, and Natural/Organic Products)	ADDITIONAL WANTS
1. Performance		
Activity	Broad spectrum activity: gram-positive & gram-negative bacteria, yeast & mold	Not likely to build microbial resis
	In formulation, at use levels, meets preservative challenge test acceptance criteria (e.g., USP 51, CTFA M-3, or similar)	
	Low number of ingredients needed to get broad spectrum activity (ideally 1 - 3 ingredients)	
pH Activity	pH 5 – 8	pH 5 – 10, best is pH 2 – 11
Shelf Life in Formulated Product	Shelf life of 2 years	Shelf life of 3 years
	Can withstand freeze/thaw	Stable from 25 to 50°C
		UV stable for 3 months in packag

- Articulates the need for new preservatives

- Provides a set of detailed development criteria for new preservatives, including:

  - Performance
  - Regulatory
  - Human health
  - Environment
  - Business factors

http://greenchemistryandcommerce.org/projects/preservatives-project

Collaborative Open Innovation Competition - Preservatives

Target Audience: Researchers in academia, small companies and individuals with promising ideas or technologies

Sponsors/Participants: Formulators, retailers, suppliers, government agencies, NGOs

InnoCentive will run competition

Judging: GC3 criteria document, performance testing and safety screening will be basis for judging new technologies

GC3 Retailer Leadership Council

Established in 2013 to promote safer chemicals, materials and products across retail supply chains.

Initial focus: direct dialogue with chemical manufacturers

AkzoNobel

BASF
The Chemical Company

Chemours

DOW

EASTMAN

GC3

Dialogue goals and framing

Joint Statement

JOINT STATEMENT ON USING GREEN CHEMISTRY AND SAFER ALTERNATIVES TO ADVANCE SUSTAINABLE PRODUCTS

Retailers are on the front lines of consumer concerns about the health and environmental impacts of chemicals in products. In response, retailers want to leverage their ability to help catalyze innovation and new solutions. Since spring 2014, thought leaders from seven major retailers[1,2] and five major chemical manufacturers[3] have been in dialogue about improving product sustainability and finding ways to accelerate the development and scale up of green chemistry solutions as well as increase transparency in the value chain. Green chemistry, focused on the design and application of safer chemical products and processes, is a core element of many firm's sustainability and/or sustainable chemistry programs. Retailers have shared feedback from their customers, their concerns about hazardous chemicals in products, and their priorities for safer products. Chemical manufacturers have shared publicly available information on their research, development, and commercialization processes, their processes for evaluating product safety and sustainability, the types of information they need to make the business case for pursuing green chemistry solutions, and their challenges in bringing these alternatives to market.

GC3 GREEN CHEMISTRY & COMMERCE COUNCIL
Business Mainstreaming Green Chemistry

Developed by the Green Chemistry & Commerce Council (GC3) with participation from the following companies:

Walmart, Staples (Make more happen), Target, BASF (We create chemistry), The Home Depot, Chemours, Best Buy, Dow, AkzoNobel, CVS Health, Eastman

- Goal setting and continuous improvement
- Communication
- Transparency
- Information on new chemicals and safer alternatives
- Green chemistry education

Next steps

- Communicate with rest of supply chain
- Identify opportunities for collaboration
- Measure progress toward meeting intent of Joint Statement