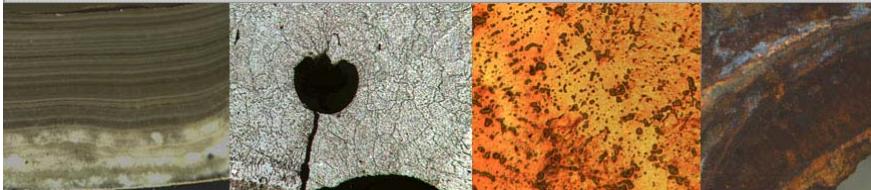


NUTS & BOLTS



New Hampshire
MATERIALS
LABORATORY, INC.

Your Problem Solving Partner

Concerns in Plastic, PVC & Phthalates and Cadmium in Children's Products

Dec. 2010 Supplement Issue

Welcome to New Hampshire Materials Laboratory

What does a rubber duck, a toy truck, and a little girl's charm bracelet have to do with NHML? The materials used to manufacture these items. We are a materials laboratory of course.

With the holidays fast approaching, we thought what a good time to devote a supplement issue on two hot topics, lead in children's jewelry and PVC plastic in children's soft toys.

Plus a few fun facts...

Tim Kenney
Laboratory Director

Plastic, PVC and Phthalates:

Let's take a look at some interesting facts, and see how all of these intertwine and the outcome of research done on Phthalates used in children's toys.

The word plastic is derived from Greek [πλαστικός \(plastikos\)](#) meaning capable of being shaped or molded. First man made plastic was invented by Alexander Parkes in 1855. This plastic was called Parkesine (a.k.a. celluloid). Fast forward to the 21 century and take a look around and you will see plastic or a form of plastic around you from rain gear to flexible hoses and tubing.

The third most widely produced plastic is polyvinyl chloride (a.k.a. PVC), is a thermoplastic polymer. So what does a rubber duck and PVC have in common? More than the average person who is not familiar with polymers (a.k.a. plastics) knows.

This is where Phthalates starts to factor into the equation. A Phthalates is a plasticizer a type of additive used to make plastics such as PVC more soft and flexible as well as prolong their lifespan or durability. Soft PVC made with Phthalates has been used for years to make children's toys including rubber ducks. Chemicals can from these additives can leach out of the plastic and cause health issues. A new federal law took effect in February 2009 banning phthalates from being used in children's toys.

It should be noted not all PVC formulations use Phthalates. Analysis by [gas chromatography](#) or liquid chromatography can establish the presence of phthalates.

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A Chocolate Crisis:

(A case history on packing materials)

As a material laboratory we are sent various materials to be tested including packing materials. The holiday season brings to mind comparative test completed on candy wrappers for a regional chocolatier.

They had us compare their wrappers to 3 other chocolate manufacturers. Our laboratory was asked to find out if the quality of their wrappers were within the same standard as the other chocolate manufacturers.

A cross section of all 4 samples which included our customer's was prepared for microscopic examination using conventional metallographic techniques. This method was used to determine the thickness of the layers of each wrapper. Mechanical properties of the wrappers were determined using tensile tests.

Both examinations brought the conclusion that our customer's wrappers were comparable with international competitors

What is Cadmium And the Concern In Children's Jewelry?

In recent months the discussion of cadmium found in children's jewelry has replaced lead, mainly due to the new laws and restrictions that have been placed on manufacturers and the use of lead.

A closer look at cadmium will help us to discover why EPA, CDC and other organizations are concerned for our children.

Cadmium is a metal naturally found in the earth's crust. Yet, it is unusual to find in pure form.

Typically, Cadmium is found in combination with other elements such as oxygen (cadmium oxide) or sulphur (cadmium sulphate).

Industry use of cadmium is a byproduct of zinc, lead, or copper from mining, smelting, and refining sulphidic ores of zinc. Cadmium is considered a toxic metal, and is considered # 7 out # 275 on the most hazardous substance in the environment list of the Center for Disease Control (CDC).

Industrial uses for cadmium include rechargeable batteries, metal plating, paint pigments, and plastic. It is known as a carcinogen and to be as toxic as lead. Cadmium can interfere with brain development as well as cause learning disabilities if ingested by a child. Cadmium can be ingested by a child from a piece of jewelry by sucking or biting it.

As laws and regulations tighten for the safety of our children, companies will look towards laboratory such as ours to test their product to ensure compliance.



Cadmium in Children's Jewelry



Chocolate

\$13 billion: the amount Americans spent in the year 2000 on chocolate

16 out of the top 20 consuming countries are European:

1. Switzerland
2. Austria
3. Ireland

66% of chocolate is consumed between meals

22% of all chocolate consumption happens between the hours of 8 p.m. and midnight

[Chocolate Trivia Find Out What You Know About Chocolate](#)

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