	TITLE			
	5000 Environmental - Packaging Heavy Elements			
	NUMBER	**REVISION**	**DATE**	**ASSIGNED AUTHOR**
	5000	1.00	2016-06-15	Ying Gao
QUALITY AND SAFETY OPERATING PROCEDURE **Mattel – Confidential Information**				**FOR QUESTIONS CONTACT** Ying Gao

1 - SCOPE (5000)

1.1 - Products and Components Covered

All packaging

1.2 - Exemptions

Try-Me Switches that are powered by batteries are exempted by this QSOP, but still require to comply with QSOP 3600, Heavy Elements.

1.3 - Definitions (Words that are defined are ***italicized and bolded*** once per section)

1.3.1 - Intermediate Package: A wrap, box, or bundle (that is a container) that contains two or more ***unit packages*** of identical items.

1.3.2 - Package: A container providing a means of marketing, protecting or handling a product and shall include a ***unit package***, an ***intermediate package*** and a ***shipping*** "Package" shall also mean and include such-unsealed receptacles such as carrying cases, crates, cups, pails, rigid foil and other trays, wrappers and wrapping films, bags and tubs.

1.3.3 - Packaging Component: A Any individual assembled part of a package such as, but not limited to: (1) Any interior or exterior blocking, bracing, cushioning such as inserts, hair holders, and twist ties; (2) **Material**: Any group of packaging components that cannot be physically sampled separately. For example, there may be many different colored inks on a chipboard box that cannot be individually sampled.

1.3.4 - Packaging Material: Any group of packaging components that cannot be physically sampled separately. For example, there may be many different colored inks on a chipboard box that cannot be individually sampled.

1.3.5 - Shipping Container: A container that is sufficiently strong to be used in commerce for packing, storing, and shipping commodities.

1.3.6 - Unit Package: The first tie, wrap, or container applied to a single item, a quantity of the same item, a set, or an item with all its component parts, that constitutes a complete and identifiable package containing the unit of issue of a product for ultimate use.

2 - PERFORMANCE REQUIREMENTS

2.1 - The sum of the total percent of the concentration levels of mercury, lead, hexavalent chromium and cadmium present in all separable packaging components shall not exceed **0.01%** (100 mg/kg or 100ppm) **by weight of the component**.
The total Chromium concentration may be used to calculate the total metals concentration. If that value is above 100 ppm, hexavalent chromium can be isolated and analyzed. The hexavalent chromium concentration is then used instead of the total chromium concentration in the metals concentration summation. Depending on the concentrations of the four metals, this may bring the final results to 100 ppm or less.

2.2 - The manufacturer, supplier or vendor of a package or packaging component shall certify that each package or component sold to Mattel is in compliance with the requirements of this QSOP. A Packaging Certification form (attached) must be signed by an authorized official of the manufacturer or supplier company.

3 - PROCEDURE

3.1 - Mattel Internal Labs

Mattel internal test laboratories must follow appropriate Global Laboratory Operating Procedure

- Test Glass and Ceramic at an external laboratory.
- Test all other materials per GLOP 7406, Total Digestion for Heavy Element Analysis

3.2 - External Labs

3.2.1 - Total Hexavalent Chromium - Cr VI

Use one of the following methods as applicable:

- ISO 3613, Chromate Conversion Coatings on Zinc, Cadmium, Aluminum-zinc Alloys, Zinc-aluminum – Test Methods or equivalent.
- EPA Test Method 3060, Alkaline Digestion for Hexavalent Chromium or equivalent.
  Variations of these extraction and analysis methods and/or use of an alternate method are acceptable if, in the expert opinion of the test laboratory, they are declared to be equivalent or better.

3.2.2 - Total All Other Elements

3.2.2.1 - Use one of the following digestion methods as applicable:

- AOAC Official Method 974.02, Lead in Paint
- EPA Method 3051A, Microwave Assisted Digestion of Sediments, Sludge, Soils, and Oils
- EPA Method 3052, Microwave Assisted Digestion of Siliceous and Organically Based Matrices.
  Variations of these digestion methods are acceptable if, in the expert opinion of the test laboratory, they are declared to be equivalent or better.

3.2.2.2 - Analyze the digestion utilizing any suitable method based on the equipment used (AA or ICP) and the element content to be determined.

3.2.2.3 - These methods are appropriate for testing Total Chromium, but not Cr VI.

3.3 - Equipment

Use equipment specified in the methods referenced in §3.5

3.4 - General Requirements

3.4.1 - Since it is often difficult to sample every component, especially inks on chipboard, a packaging material (a composite of packaging components) may be sampled and analyzed in place of each inseparable component. The composite must be representative of the inseparable components.

3.4.2 - For inseparable colors on chipboard and other shreddable materials, the material will be shredded into pieces no larger than 5 mm^2 and mixed thoroughly. The 1-2 gram sample will be taken from the well mixed shredded material.
Example: Consider a BARBIE doll package with the following components 1) a PVC window, 2) plastic ties, 3) a one color, green chipboard insert, and 4) an outer colored chipboard box with a purple back, and a front colored pink with white and blue small dots (the front colors are small and it is not feasible to sample each separate color).

3.4.3 - The following samples would be taken from the following package components:

1. PVC window
2. plastic tie
3. green chipboard insert
4. purple chipboard back, and

A composite sample would be taken of the following shredded, well mixed package material:

Pink with white and blue small dots colored chipboard.

3.5 - Method

3.5.1 - Sampling

3.5.1.1 - Obtain a sample of each ***packaging material*** and ***packaging component***

3.5.1.2 - For inseparable colors on chipboard and other shreddable materials, shred the material into pieces no larger than 5 mm^2 and mix thoroughly. For example:
If a package contains eight different components as described below then the sample preparation would be as follows:

SAMPLE #	COMPONENT #	COMPONENT	PREPARATION
1	1	window PVC	Individual
2	2	pink color print	Components 2-6 are inseparable and are shredded, well mixed, and sampled as one material.
	3	blue color print	
	4	yellow color print	
	5	white color print	
	6	chipboard	
3	7	corrugate insert	Individual
4	8	plastic endcaps	Individual

3.5.2 - Calculate concentration

Sum the Mercury, Lead, Cadmium, and Hexavalent Chromium concentrations for each sample. The total must be below 100 mg/kg for each separable packaging component. Alternatively, sum the Mercury, Lead, Cadmium and Total Chromium concentrations. If the total is greater than 100 mg/kg, perform Chromium VI testing and re-calculate the sum of all four metals. Again, the total must be below 100 mg/kg for each separable packaging component.

4 - HISTORY

4.1 - Significance

To determine if the total concentrations of the heavy metals mercury, lead, cadmium, and hexavalent chromium in packaging or packaging components are below the 100 mg/kg (ppm) as regulated by Toxics in Packaging legislation.

4.2 - Reason For Revision (5000)

Section	Revision 1.00	Implementation
All	Uploaded document to Polarion	Editorial
1.2	Updated test requirement of Try-Me Switches	Editorial

Section	Revision C	Implementation
1.2	Adds exemption for Try-Me switches	Immediate
2.1	Modified wording to make it clear that all separable components of the packaging must meet the 100 ppm requirement	All product shipped on or after: **January 1, 2010**
3	Aligned the test methods with QSOP 0006-3600 Heavy Elements	Immediate
5	Removes FAQ regarding try-me switches to align with exemption	Editorial
All	Replaced the references to “CONEG”, with the updated “Toxics in Packaging” to reflect current naming	Editorial
All	Reviewed and correct formatting	Editorial

4.3 - Referenced Documents

- Toxics in Packaging Clearinghouse Model Legislation
- California AB 455 – Toxics in Packaging Prevention Act
- California AB 2021 – Amendments to the Toxics in Packaging Prevention Act
- Connecticut General Assembly, CGS Section 22a-255g to 22a-255m
- Illinois, 415 ILCS 5/21.5, Section 21.5 Toxic Packaging Reduction
- Washington State Revised Code of Washington (RCW) chapter 70.95d, Packages Containing Metals

5 - FREQUENTLY ASKED QUESTIONS (None)

6 - ATTACHMENTS

6.1 - Packaging Certification

Packaging Certification

PACKAGING CERTIFICATION

By signature of this document, the vendor certifies that all packages and package components sold to Mattel, Inc., its subsidiaries and their respective vendors have been tested in accordance with, and meet the heavy elements limitations of, Mattel Quality and Safety Operating Procedure #0006-5000 "Testing For Total Heavy Elements in Packaging Materials". This conforms to the Toxics in Packaging Clearinghouse Model Legislation; namely that the sum of the concentration levels of lead, cadmium, mercury and hexavalent chromium present in any package, including all packaging components, shall not exceed the following:

100 parts per million by weight

We further certify that in the cases where the regulated metals are present at levels below the schedule stated above, the regulated metals were not intentionally added during the manufacturing process.

We will maintain appropriate documentation in support of this certification. Documentation will be made available for inspection.

Company: _____

Address: _____

Certified by: _____
(Type or print name and title)

Signature: _____

Date: _____

7 - APPENDICES (None)