


RMS		2903 Colorants			
		Number	Revision	Date	Assigned Author
		2903	3.00	2020-01-06	Ying Gao
	RAW MATERIAL SPECIFICATION			FOR QUESTIONS CONTACT Ying Gao	
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1 - SCOPE (2903)

1.1 - Products and Components Covered

This document applies to all suppliers who supply **colorants** used for molding process.

1.2 - Exemptions (None)

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

1.3.1 - Colorants: Examples – pigments, dyes, etc. Types of colorants:

- Dry color (powder colorant)
- Liquid color
- Masterbatch. Pelletized colorants comprised of high concentrations of pigments and/or dyes that have been pre-dispersed in a polymer vehicle.
- Pre-colored compound. The molder or extruder need not blend, disperse, or distribute the color. Instead, the resin itself is custom colored by either a resin producer or a specialty compounder.

1.3.2 - Composite Sample: A sample made from combining more than one material or color, e.g., paint (red, yellow, and blue); vacuum metalized coating (silver and gold). It is not considered compositing when colors or materials cannot be separated (e.g., thin stripes, doll eyes) are tested together.

1.4 - Purpose

Evaluate raw materials for compliance to Mattel safety standards for heavy elements content.

2 - PERFORMANCE REQUIREMENTS

2.1 - Heavy elements content must be less than the limits per **Table 1**.

Table 1 - Test Limits

ELEMENT	TOTAL (ppm)	SOLUBLE METHOD 1 (ppm)
Antimony (Sb)	-	30
Arsenic (As)	-	10
Barium (Ba)	-	250
Cadmium (Cd)	40	17
Chromium (Cr)	500	30
Lead (Pb)	20	20
Mercury (Hg)	500	30

Selenium (Se)	-	150
Aluminum (Al)		28130
Boron (B)		15000
Cobalt (Co)		130
Copper (Cu)		7700
Manganese (Mn)		15000
Nickel (Ni)	10000	930
Strontium (Sr)		56000
Tin (Sn)		180000
Zinc (Zn)		46000
Chromium VI (CrVI)*		0.053
Organic Tin*		12

NOTE:

* The method for the detection of these elements are still to be determined. Refer to [QSOP 3600, Heavy Elements](#) for the screening process of Organic Tin.

2.1.1 - If a **colorant** (except pre-colored compound) test results are greater than the limits per table 1, the following calculation(Source: Samwoo Chemicals Ltd. (www.samwoo.com.hk)) may apply to either accept or reject the material:

2.1.1.1 - Dry or liquid color:

- 'Analytical Test Results' * 4% ≤ 'Limit per Table 1'

2.1.1.2 - Masterbatch:

- 'Analytical Test Results' * 8% ≤ 'Limit per Table 1'

2.1.1.3 - **Composite sample:**

- 'Analytical Test Results of Composite Sample' * X * Number of Colorants ≤ 'Limit per **Table 1**'; where X = 4% for dry or liquid color and 8% for masterbatch.

3 - PROCEDURE

3.1 - Environment (N/A)

3.2 - Equipment (N/A)

3.3 - General Requirements

3.3.1 - Pigment material may be tested in powder or liquid form.

3.3.2 - Refer to [QSOP 3600, Heavy Elements](#) for test methodology.

3.4 - Method (N/A)

4 - DOCUMENT HISTORY AND SUPPORTING INFORMATION

4.1 - Significance

Compliance can be assured by using a testing and compliance system that will reduce the risk of finished products having an excessive amount of heavy elements.

4.2 - Reason For Revision (2903)

Section	Revision 3.00	Implementation
Table 1	Updated the requirement limit of Aluminum per EU Directive 2019/1922.	Applied to all products manufactured on and after: May 20, 2020
4	Revised title of section.	Editorial

Section	Revision 2.00	Implementation
2.1, Table 1	Lowers the limit for Cr VI per Amendment of EU TSD and Costco's request.	Applies to all raw materials received on or after: August 15, 2018
5.1, A1	Updated the limit of antimony to 30 ppm	Editorial

4.3 - Referenced Documents

- [GQMP 2118](#), Substrate Material Control
- [GQMP 2119](#), Heavy Elements Control on Substrates for Vendors
- [QSOP 3600](#), Heavy Elements

5 - FREQUENTLY ASKED QUESTIONS

5.1 - Question 1

Question: Can the results from Total testing be corrected before comparing with Soluble 1 specification limits?

Answer: Yes. The above calculation (§2.1.1) can be used to correct Total results when comparing against Soluble 1 limits. For example, a total test on a Masterbatch colorant shows a result of 40 ppm for Antimony (Sb). When comparing against Soluble 1 limits, the total result can be reduced down to 8% (3.2 ppm) before determining action. Therefore, since 3.2 ppm < 30 ppm (the limit of Antimony), the sample passes.

6 - ATTACHMENTS (None)

7 - APPENDICES (None)

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