

	GLOBAL QUALITY ASSURANCE SAFETY & RELIABILITY SPECIFICATIONS		
	TITLE: PLASTICIZER & STABILIZER SPECIFICATION		NUMBER: SRS-046
	REVISION:	AUTHOR:	DATE:
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		APPROVED BY QA TECHNICAL COMMITTEE	7/8/20

1.0 PURPOSE

To provide a specification that indicates the use of appropriate plasticizers and heat stabilizers included in Hasbro, Inc. products. Compliance with the requirements of this specification will provide conformance to US, Canadian and European requirements on phthalates.

2.0 SCOPE

All Hasbro, Inc. toy, game, and childcare products shall comply with requirements of this specification.

3.0 EXEMPTIONS

The following components/materials are exempt from the requirements of this specification:

- 3.1 Products with Age Grades \geq 14 years (unless they are CE marked as toys).
- 3.2 Batteries.
- 3.3 Non-Toy, non-game, or non-childcare products. (e.g. a DVD projector or other consumer electronics).
- 3.4 Non-retainable packaging.

NOTE: Packaging materials intended to be retained by an adult for reference purposes (e.g. to keep the date code) are also exempt.

4.0 DEFINITIONS

4.1 Phthalate

Salt or ester of phthalic acid used as plasticizers and in solvents.

The names and CAS numbers of the restricted phthalates are as follows:

- 4.1.1 DEHP – Bis(2-ethylhexyl) Phthalate
(CAS# 117-81-7)
- 4.1.2 DBP – Dibutyl Phthalate
(CAS# 84-74-2)
- 4.1.3 BBP – Benzylbutyl Phthalate
(CAS# 85-68-7)
- 4.1.4 DINP – Diisononyl Phthalate
(CAS#s 28553-12-0 & 68515-48-0)
- 4.1.5 DIDP – Diisodecyl Phthalate
(CAS#s 26761-40-0 & 68515-49-1)

- 4.1.6 DNHP – Di-n-hexyl Phthalate (also referred to as DHEXP)
(CAS# 84-75-3)
- 4.1.7 DNOP – Di(N-octyl) phthalate
(CAS# 117-84-0)
- 4.1.8 DIBP – Diisobutyl Phthalate
(CAS# 84-69-5)
- 4.1.9 DPENP – Di-n-pentyl Phthalate (also referred to as DPP)
(CAS# 131-18-0)
- 4.1.10 DCHP – Dicyclohexyl Phthalate
(CAS# 84-61-7)
- 4.1.11 DIHP – Diisooheptyl Phthalate
(CAS# 41451-28-9 & 71888-89-6)
- 4.1.12 DMEP – Bis(2-methoxyethyl) Phthalate
(CAS # 117-82-8)
- 4.1.13 DIPP – Diisopentyl Phthalate
(CAS# 605-50-5)
- 4.1.14 DEP – Diethyl Phthalate
(CAS# 84-66-2)
- 4.1.15 TBPH – Bis (2-ethylhexyl) Tetrabromophthalate
(CAS# 26040-51-7)
- 4.1.16 1,2-Benzenedicarboxylic Acid, Dihexyl Ester, Branched and Linear
(CAS# 68515-50-4)
- 4.1.17 DNHUP - 1,2-Benzenedicarboxylic Acid, Di-C7-11-Branched and Linear
Alkyl Esters
(CAS# 68515-42-4)
- 4.1.18 1,2-Benzenedicarboxylic Acid, Dipentylester, Branched and Linear
(CAS# 84777-06-0)
- 4.1.19 1,2-Benzenedicarboxylic Acid, Mixed Decyl and Hexyl and Octyl Diesters
(CAS# 68648-93-1)
- 4.1.20 1,2-Benzenedicarboxylic Acid, Di-C6-10-alkyl Esters
(CAS# 68515-51-5)
- 4.1.21 N-pentyl-isopentyl Phthalate
(CAS# 776297-69-9)
- 4.1.22 Diisohexyl Phthalate
(CAS# 71850-09-4)

4.2 Required limit

Phthalate content limits which materials are not allowed to exceed.

4.3 Action limit

Phthalate content limits that, if exceeded, require some further action.

5.0 SPECIFICATIONS

5.1 Prohibited Phthalate Plasticizers

Phthalates listed under section 5.5 shall not be intentionally added to Hasbro, Inc plasticized materials or materials that may contain phthalates (examples listed in section 6.2). Incidental phthalate contents shall not exceed the maximum allowable limits indicated under section 5.5.

5.2 Action Limit

When a phthalate content level exceeds the action limit listed in section 5.5, retest to confirm the result. If the second test result is confirmed to exceed the action limit, an investigation shall be carried out and a corrective action plan shall be determined by QA management and the development team in order to implement a course of action to ensure that a resulting phthalate level will conform to the action limit.

Note: for incoming materials, refer to the action limit disposition requirements listed in QA-049 Factory Incoming Materials Chemical Control requirements.

5.3 Plasticizers

5.3.1 The only approved primary plasticizers for use in Hasbro Products are:

5.3.1.1 Vertellus Citroflex A-4 (CAS# 77-90-7)

5.3.1.2 Jungbuzlauer Citrofoil BII ATBC (CAS# 77-90-7)

5.3.1.3 BASF Hexamoll DINCH (CAS# 166412-78-8)

5.3.1.4 Eastman 168 (DOTP) (CAS# 6422-86-2)

5.3.1.5 Emery MC987 (CAS# 68551-87-1)

5.3.1.6 Eastman TXIB (CAS# 6846-50-0)

NOTE: Other plasticizers may be used but they shall be approved by the Corporate Hasbro Chemistry team.

5.4 Stabilizers

5.4.1 Stabilizers approved for use are Calcium/Zinc, Zinc or Magnesium/Zinc based, or Polyol, Organophosphate that are Phenol & Alkylphenol-free, or Epoxy based. Others may be used upon approval by the Corporate Hasbro Chemistry team.

5.4.2 Stabilizers NOT acceptable for use:

5.4.2.1 Tri-substituted organotin substances such as tributyltin (TBT) and triphenyltin (TPT) shall not be used in Hasbro Inc. products including the packaging materials and shall not be present in amounts greater than 0.1% by weight of "Tin". Compliance may be verified by component testing.

5.4.2.2 Dibutyltin (DBT) compounds shall not be used in Hasbro Inc. products including the packaging materials and shall not be present in amounts greater than 0.1% by weight of Tin. Compliance may be verified by component testing.

5.4.2.3 Dioctyltin (DOT) compounds may not be used in Hasbro Inc. products and shall not be present in amounts greater than 0.1% by

weight of Tin. DOT compounds may be allowed in packaging materials under agreement from EU Quality Assurance management.

NOTE: see SRP-025 for Hasbro policy on organotin (oSn) compounds in clear PVC.

5.5 “Restricted” Phthalate Limits

The incidental “restricted” phthalate content of Hasbro, Inc. plasticized materials shall not exceed the following limits:

<u>Toys, Games, and Childcare Articles</u>		
<u>Plasticizer</u>	<u>Action Limit</u>	<u>Required Limit</u>
DEHP, DBP, BBP, DIBP	0.01 % (100 ppm)	0.1% (1000 ppm)*
DINP, DIDP, DNOP	0.01 % (100 ppm)	0.1% (1000 ppm)*
DIHP, DMEP, DIPP, DPENP/DPP, DNHP	0.01 % (100 ppm)	0.1% (1000 ppm)*
DCHP	0.01 % (100 ppm)	0.1% (1000 ppm)
DEP	0.01 % (100 ppm)	0.1% (1000 ppm)
TBPH	0.01 % (100 ppm)	0.1% (1000 ppm)
1,2-Benzenedicarboxylic Acid, Dihexyl Ester	0.05 % (500 ppm)	0.1% (1000 ppm)
DHNUP	0.05 % (500 ppm)	0.1% (1000 ppm)
1,2-Benzenedicarboxylic Acid, Dipentylester	0.05 % (500 ppm)	0.1% (1000 ppm)
1,2-Benzenedicarboxylic Acid, Mixed Decyl and Hexyl and Octyl Diesters	0.05 % (500 ppm)	0.1% (1000 ppm)
1,2-Benzenedicarboxylic Acid, Di-C6-10-alkyl Esters	0.05 % (500 ppm)	0.1% (1000 ppm)
N-pentyl-isopentyl Phthalate	0.05 % (500 ppm)	0.1% (1000 ppm)
Diisohexyl Phthalate	0.05 % (500 ppm)	0.1% (1000 ppm)

*NOTE 1: the limit applies to the sum of the indicated phthalates as a group as well as individually.

NOTE 2: if any of the phthalates in the DIHP, DMEP, DIPP, DPENP/DPP, DNHP group are over the action limit, they should also be assessed in combination with DEHP, DBP, BBP & DIBP to a combined limit of 0.1% (1000 ppm).

6.0 MATERIALS WITH POTENTIAL/NO POTENTIAL FOR PHTHALATE CONTENT

6.1 Materials with **NO** potential for phthalate content:

- 6.1.1 Polystyrene (e.g. HIPS, MIPS, SHIPS, GPPS)
- 6.1.2 Polypropylene (PP)
- 6.1.3 ABS
- 6.1.4 Polyethylene (PE)
- 6.1.5 Polycarbonate
- 6.1.6 Polyesters
- 6.1.7 SAN
- 6.1.8 Nylon
- 6.1.9 Delrin (Polyoxymethylene)
- 6.1.10 Natural Wood
- 6.1.11 Textiles made from natural fibers (e.g. cotton or wool etc.) or from common synthetic fibers (e.g. polyester, acrylic, nylon). However, printed decorations or other surface coatings surface treatments applied to textiles are NOT exempt.
- 6.1.12 Unfinished Metal
- 6.1.13 Mineral products such as sand, glass, and crystal.
- 6.1.14 Paper and paperboard (however, flexible coatings on paper are not exempt).
- 6.1.15 Untreated and unfinished particleboard, hardwood plywood, medium density fiberboard, made from virgin wood or pre-consumer wood waste.

6.2 Materials **WITH** potential for phthalate content:

- 6.2.1 PVC
- 6.2.2 Polyvinylidene Chloride (PVDC)
- 6.2.3 Rubber
- 6.2.4 Silicone
- 6.2.5 EVA and PVA
- 6.2.6 Cellulosics
- 6.2.7 Kraton
- 6.2.8 Polyurethane
- 6.2.9 Adhesives
- 6.2.10 PET
- 6.2.11 Elastic materials on apparel (e.g. Sleepwear)

6.2.12 Sealants

6.2.13 SEBS

6.2.14 Natural Latex

NOTE: If a material is not on the list it shall be evaluated by the Corporate Hasbro Chemistry Team for phthalate potential & listed accordingly.

7.0 TEST METHODS

7.1 For chemical tests at pilot stages, all samples shall be taken from finished products. For surface coatings, the samples shall be obtained from at least 10 pieces to a maximum of 40 pieces of decorated components from production lines of finished products.

NOTE: If the mass of a surface coating sample is ≥ 50 mg, then it shall be tested individually. For a surface coating sample with mass of less than 50 mg or a surface area of less than 3 mm x 3 mm, the factory shall submit repeatedly decorated components (applying identical coating process on same substrate as that of the finished product) for testing.

7.2 Composite testing up to three samples of equal weight may be utilized for phthalate test whenever analytically feasible as long as the MDL of the test method used allows a result to be obtained at an action level determined as $1/\{\text{number of composite samples}\}$ (e.g. for two samples, the MDL of the test method would need to be less than $50/2 = 25$ ppm). Only identical materials with secondary variances may be composited (e.g. differing colors). If any of the phthalates are detected at levels that would exceed a limit if the weights were calculated individually (i.e. one third of the limit for 3-in-1 mix of equal weights), then individual retests shall be carried out.

7.3 Acceptable test methodologies for the determination of the presence & concentration of phthalates are as follows:

7.3.1 CPSC-CH-C1001-09.4

7.3.2 ISO 8124 part 6

7.3.3 ASTM D3421

7.3.4 GB/T 22048

7.3.5 ISO 14389 (for textile materials)

7.4 The acceptable test methodology for the determination of the presence & concentration of oSn is as follows:

7.4.1 EN71 part 3 for soluble content

8.0 REFERENCES

8.1 ASTM D3421, "Standard Recommended Practice for Extraction and Analysis of Plasticizer Mixtures from Vinyl Chloride Plastics".

8.2 EU Directive on phthalates 2005/84/EC 14th December 2005.

- 8.3 California Proposition 65.
- 8.4 CPSC statement of policy regarding component part testing for Phthalates, August 7, 2009.
- 8.5 Commission decision of 28th May 2009 on Organostannic compounds.
- 8.6 Toys Safety Directive 2009/48/EC.
- 8.7 REACH Regulation (EC) No 1907/2006.
- 8.8 Chronic Hazard Advisory Panel on Phthalates and Phthalate Alternatives July 2014.
- 8.9 16 CFR 1107.
- 8.10 16 CFR 1308.
- 8.11 CPSC-CH-C1001-09.4 Standard Operating Procedure for Determination of Phthalates.
- 8.12 ISO 8124 part 6: Certain Phthalate Esters in Toys and Children's Products.
- 8.13 GB/T 22048 Determination of Certain Phthalate Esters in Toys and Children's Products.
- 8.14 EN71-3.
- 8.15 SRP-025 Chemical Requirements for Vendor Chemical Programs.
- 8.16 ISO 14389 Textiles -- Determination of the phthalate content -- Tetrahydrofuran method
- 8.17 Washington State Children's Safe Products Act (CSPA)
- 8.18 QA-049 Factory Incoming Materials Chemical Control requirements

9.0 REVISION LOG

Revision	Sections Revised	By	Date
AB	4.1, 4.3, 5.2, 5.5, 8.18	JGH	7/8/20
AA	1.0, 4.1.14 – 4.1.23, 5.5, 8.17	JGH	1/29/20
Z	5.3, 5.5, 7.3, 8.7, 8.11, 8.16	JGH	5/7/19
Y	6.1.15	JGH	7/12/18
X	3.4, 4.2, 4.3, 5.1, 5.2, 5.3, 5.4, 5.6, 6.1, 6.2, 7.9, 7.10	JGH	4/18/18
W	Update format, 4.1, 5.4.2.2, 5.4.2.3, 5.6, 7.8	JGH	4/7/15
V	6.5	CJF	10/25/10
U	Title, 6.4.2, 5.1, 6.4.3	CJF	6/9/10
T	6.4.2, 7.5, 7.6, 7.7	CJF	4/5/10
S	5.1, 5.2	CJF	2/25/10
R	5.1, 5.2, 7.4, 4.1, 6.3	CJF	8/24/09
Q	6.1, 6.7, 3.0	CJF	7/20/09
P	5.2	CJF	6/24/08
O	6.6	CJF	3/20/08
N	5.1, 5.2	CJF	1/15/08
M	4.0, 5.0	CJF	12/10/07
L	2.0, 4.4	CJF	10/29/2007
K	3.0	CJF	12/10/2006

J	3.0, 4.2, 4.2.1, 4.3, 4.4	CJF	9/1/2006
H	3.0	CJF	3/10/2006
G	All	CJF	4/2/2005