DIN EN 71-3:2017-10 (E)

Safety of toys - Part 3: Migration of certain elements (includes Amendment A2:2017)

Contents

Page

European foreword 5

Introduction 7

1 Scope 8

2 Normative references 8

3 Terms and definitions 8

4 Requirements 10
4.1 Toy material categories (see H.4) 10
4.2 Specific requirements 10

5 Principle 11

6 Reagents and apparatus 12
6.1 Reagents 12
6.2 Apparatus 12

7 Sampling and sample preparation 12
7.1 Selection of test portions 12
7.2 Standards preparation 13
7.3 Sample preparation 13
7.4 Migration procedure 15

8 Methods of analysis 18

9 Calculation of results 18
9.1 General elements 18
9.2 Chromium (III) and Chromium (VI) 19
9.3 Organic tin 19

10 Test report 21

Annex A (informative) Significant technical changes between this European Standard and the previous version 22

Annex B (informative) Method performance 24

B.1 Method performance 24
B.2 Use of measurement uncertainty in compliance assessment 24
B.3 Information on round robin test 24

Annex C (normative) Sieve requirements 26

Annex D (informative) Preparation and analysis of test portion 27

Annex E (informative) Method of analysis for general elements 28

E.1 Principle 28
E.2 Working solutions 28

E.2.1 Working solutions ICP-MS 28
E.2.2 Working solutions ICP-OES 29
E.3 Procedure 31
E.4 Analysis 31
E.4.1 General 31
E.4.2 Limit of detection and quantification 32

Annex F (informative) Methods of analysis for speciation of Chromium (III) and (VI) 34

F.1 Principle 34
F.2 Reagents 34
F.3 Apparatus 35
F.4 Procedure 36
F.5 Analysis 36
F.5.1 General 36
F.5.2 LC-ICP-MS conditions 36
F.5.3 Limit of detection and quantification 37

Annex G (informative) Method of analysis for organic tin (see H.10) 39

G.1 Principle 39
G.2 Terms and definitions 40
G.3 Reagents 40
G.4 Apparatus 43
G.5 Procedure 43
G.5.1 Sample derivatisation 43
G.5.2 Calibration standards 43
G.6 Analysis 44
G.6.1 General 44
G.6.2 Example of GC conditions 46
G.6.3 Example of MS conditions 47
G.6.4 Limit of detection and quantification 47
G.6.5 Example of a GC/MS chromatogram 48

Annex H (informative) Rationale 49

H.1 General 49
H.2 Mouthing behaviour of children (Scope) 49
H.3 Skin contact (Scope) 49
H.4 Toy categories (4.1) 50
H.5 Test portions (7.1, 7.3.3.2, 7.3.3.3, 7.3.3.6) 50
H.6 Size of test pieces (7.3.3.2, 7.3.3.3, 7.3.3.4) 50
H.7 Textile threads 50
H.8 Chromium (VI) migration (7.4) 50
H.9 Filtration of migration solutions (7.4.2.1, 7.4.2.2, 7.4.3.1, 7.4.3.3, 7.4.3.5) 51
H.10 Organic tin (9.3) 51
H.11 pH value 51
H.12 De-waxing (see 7.3.2) 52

Annex I (informative) Conformity assessment 53

I.1 General 53
I.2 Chromium VI 53

Annex J (informative) List of other organic tin compounds 54

Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2009/48/EC 55

Bibliography 56