

# DIN EN 71-3:2013-07 (E)

## Safety of toys - Part 3: Migration of certain elements

---

<b>Contents</b>		<b>Page</b>
Foreword .....		4
Introduction .....		6
1	Scope .....	7
2	Normative references .....	7
3	Terms and definitions .....	7
4	Requirements .....	8
4.1	Toy material categories (see H.4) .....	8
4.2	Specific requirements .....	9
5	Principle .....	10
6	Reagents and apparatus .....	11
6.1	Reagents .....	11
6.2	Apparatus .....	11
7	Sampling and sample preparation .....	11
7.1	Selection of test portions .....	11
7.2	Standards preparation .....	12
7.3	Sample preparation .....	12
7.3.1	General .....	12
7.3.2	Category I: Dry, brittle, powder like or pliable and Category II: Liquid or sticky .....	12
7.3.3	Category III: Scraped-off .....	12
7.4	Migration procedure .....	14
7.4.1	General .....	14
7.4.2	Category I: Dry, brittle, powder like or pliable and Category II: Liquid or sticky .....	14
7.4.3	Category III: Scraped-off .....	15
8	Methods of analysis .....	16
9	Calculation of results .....	17
9.1	General elements .....	17
9.1.1	Calibration curve .....	17
9.1.2	Calculation of migration .....	17
9.1.3	Interpretation of results .....	17
9.2	Chromium (III) and Chromium (VI) .....	17
9.2.1	Calibration curve .....	17
9.2.2	Calculation of migration .....	17
9.2.3	Interpretation of results .....	18
9.3	Organic tin .....	18
9.3.1	Calibration curves .....	18
9.3.2	Calculation of migration of single organic tin compound .....	18
9.3.3	Calculation of migration of organic tin .....	19
9.3.4	Interpretation of results .....	19
10	Test report .....	19

<b>Annex A (informative) Significant technical changes between this European Standard and the previous version .....</b>	<b>21</b>
<b>Annex B (informative) Method performance .....</b>	<b>22</b>
<b>B.1 Method performance .....</b>	<b>22</b>
<b>B.2 Use of measurement uncertainty in compliance assessment .....</b>	<b>22</b>
<b>B.3 Information on round robin test .....</b>	<b>22</b>
<b>Annex C (normative) Sieve requirements .....</b>	<b>24</b>
<b>Annex D (informative) Preparation and analysis of test portion .....</b>	<b>25</b>
<b>Annex E (informative) Method of analysis for general elements .....</b>	<b>26</b>
<b>E.1 Principle .....</b>	<b>26</b>
<b>E.2 Working solutions .....</b>	<b>26</b>
<b>E.2.1 Working solutions ICP-MS .....</b>	<b>26</b>
<b>E.2.2 Working solutions ICP-OES .....</b>	<b>27</b>
<b>E.3 Procedure .....</b>	<b>28</b>
<b>E.4 Analysis .....</b>	<b>28</b>
<b>E.4.1 General .....</b>	<b>28</b>
<b>E.4.2 Limit of detection and quantification .....</b>	<b>28</b>
<b>Annex F (informative) Methods of analysis for speciation of Chromium (III) and (VI) .....</b>	<b>30</b>
<b>F.1 Principle .....</b>	<b>30</b>
<b>F.2 Reagents .....</b>	<b>30</b>
<b>F.3 Apparatus .....</b>	<b>31</b>
<b>F.4 Procedure .....</b>	<b>31</b>
<b>F.5 Analysis .....</b>	<b>32</b>
<b>F.5.1 General .....</b>	<b>32</b>
<b>F.5.2 LC-ICP-MS conditions .....</b>	<b>32</b>
<b>F.5.3 Limit of detection and quantification .....</b>	<b>33</b>
<b>Annex G (informative) Method of analysis for organic tin (see H.10) .....</b>	<b>34</b>
<b>G.1 Principle .....</b>	<b>34</b>
<b>G.2 Terms and definitions .....</b>	<b>34</b>
<b>G.3 Reagents .....</b>	<b>35</b>
<b>G.4 Apparatus .....</b>	<b>37</b>
<b>G.5 Procedure .....</b>	<b>38</b>
<b>G.5.1 Sample derivatisation .....</b>	<b>38</b>
<b>G.5.2 Calibration standards .....</b>	<b>38</b>
<b>G.6 Analysis .....</b>	<b>38</b>
<b>G.6.1 General .....</b>	<b>38</b>
<b>G.6.2 Example of GC conditions .....</b>	<b>39</b>
<b>G.6.3 Example of MS conditions .....</b>	<b>39</b>
<b>G.6.4 Limit of detection and quantification .....</b>	<b>39</b>
<b>G.6.5 Example of a GC/MS chromatogram .....</b>	<b>41</b>
<b>Annex H (informative) Rationale .....</b>	<b>42</b>
<b>H.1 General .....</b>	<b>42</b>
<b>H.2 Mouthing behaviour of children (Scope) .....</b>	<b>42</b>
<b>H.3 Skin contact (Scope) .....</b>	<b>42</b>
<b>H.4 Toy categories (4.1) .....</b>	<b>43</b>
<b>H.5 Test portions (7.1, 7.3.3.2, 7.3.3.3, 7.3.3.6) .....</b>	<b>43</b>
<b>H.6 Size of test pieces (7.3.3.2, 7.3.3.3, 7.3.3.4) .....</b>	<b>43</b>
<b>H.7 Textile threads .....</b>	<b>43</b>
<b>H.8 Chromium (VI) migration (7.4) .....</b>	<b>43</b>
<b>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) .....</b>	<b>44</b>

<b>H.10</b>	<b>Organic tin (9.3)</b> .....	<b>44</b>
<b>H.11</b>	<b>pH value</b> .....	<b>44</b>
<b>Annex I (informative) Conformity assessment</b> .....		<b>45</b>
<b>I.1</b>	<b>General</b> .....	<b>45</b>
<b>I.2</b>	<b>Chromium VI</b> .....	<b>45</b>
<b>Annex J (informative) List of other organic tin compounds</b> .....		<b>46</b>
<b>Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2009/48/EC</b> .....		<b>47</b>
<b>Bibliography</b> .....		<b>48</b>