

# DIN EN 71-12:2013-07 (E)

## Safety of toys - Part 12: N-nitrosamines and N-nitrosatable substances

---

Contents		Page
Foreword .....		4
Introduction .....		6
1 Scope .....		7
2 Normative references .....		7
3 Terms and definitions .....		7
4 Requirements .....		8
4.1 Requirements for finger paints .....		8
4.2 Requirements for elastomers .....		8
5 Principle .....		9
6 Reagents and apparatus .....		9
6.1 Reagents .....		9
6.2 Standards .....		10
6.3 Apparatus .....		10
7 Sample preparation .....		11
7.1 General .....		11
7.2 Finger paints .....		11
7.2.1 N-nitrosamines .....		11
7.2.2 N-nitrosatable substances .....		11
7.3 Elastomers .....		12
7.3.1 Sample preparation for balloons .....		12
7.3.2 Sample preparation for other toys or parts of toys than balloons .....		12
7.3.3 Nitrosation .....		13
7.3.4 Preparation of solution for determination of N-nitrosamines by HPLC-MS/MS .....		13
8 Methods of analysis .....		13
8.1 General .....		13
8.2 HPLC chromatographic conditions .....		13
8.3 MS/MS conditions .....		14
8.4 Confirmation of detected N-nitrosamines .....		15
9 Calculation of results for N-nitrosamines and N-nitrosatable substances .....		16
9.1 Finger paint .....		16
9.1.1 General .....		16
9.1.2 N-nitrosamines .....		16
9.1.3 N-nitrosatable substances .....		17
9.2 Elastomers .....		17
9.2.1 General .....		17
9.2.2 N-nitrosamines .....		18
9.2.3 N-nitrosatable substances .....		18
10 Quality .....		19
10.1 Finger paints .....		19
10.1.1 Repeatability, reproducibility and measurement uncertainty .....		19
10.1.2 Limits of detection (LOD) and quantification (LOQ) .....		19

<b>10.2</b>	<b>Elastomers .....</b>	<b>19</b>
<b>10.2.1</b>	<b>Repeatability, reproducibility and measurement uncertainty .....</b>	<b>19</b>
<b>10.2.2</b>	<b>Limits of detection and quantification .....</b>	<b>20</b>
<b>11</b>	<b>Test report .....</b>	<b>20</b>
<b>Annex A (informative) Background and rationale for this European Standard .....</b>		<b>22</b>
<b>A.1</b>	<b>Requirements for finger paints (see 4.1) .....</b>	<b>22</b>
<b>A.2</b>	<b>Requirements for elastomers (see 4.2) .....</b>	<b>22</b>
<b>A.3</b>	<b>Avoidance N-nitrosamines in finger paints .....</b>	<b>22</b>
<b>A.4</b>	<b>Explanation for decision to do static migration for elastomers .....</b>	<b>22</b>
<b>A.5</b>	<b>Reference to other standards and relevant deviations .....</b>	<b>23</b>
<b>A.6</b>	<b>Conditions for nitrosation .....</b>	<b>23</b>
<b>A.7</b>	<b>NDELA in balloons .....</b>	<b>23</b>
<b>A.8</b>	<b>Selection of N-nitrosamines specified in this standard .....</b>	<b>23</b>
<b>Annex B (informative) Sample storage conditions .....</b>		<b>24</b>
<b>Annex C (informative) A-deviations .....</b>		<b>25</b>
<b>Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2009/48/EC .....</b>		<b>26</b>
<b>Bibliography .....</b>		<b>27</b>