

# DIN EN 14944-3 :2008-05 (E)

## Influence of cementitious products on water intended for human consumption\_ - Test methods\_- Part\_3: Migration of substances from factory-made cementitious products

---

### Contents

	Page
<b>Contents</b>	<b>2</b>
<b>Foreword</b>	<b>5</b>
<b>Introduction</b>	<b>7</b>
<b>1 Scope</b>	<b>8</b>
<b>2 Normative references</b>	<b>8</b>
<b>3 Terms and Definitions</b>	<b>8</b>
<b>4 Principle</b>	<b>10</b>
<b>5 Reagents</b>	<b>11</b>
5.1 General requirements	11
5.2 Disinfection reagents	11
5.2.1 Sodium hypochlorite solution	11
5.2.2 Disinfection treatment water	11
5.3 Waters to be used for testing	11
5.3.1 Preconditioning water	11
5.3.2 Test water	11
5.3.3 Test water without chlorine content (chlorine-free)	11
5.3.4 Test water with chlorine content (chlorinated)	11
5.4 Cleaning liquids for apparatus	11
<b>6 Apparatus</b>	<b>11</b>
6.1 General	11
6.2 Apparatus and materials for test piece preparation (see normative Annex A, Annex B and Annex C)	12
6.2.1 Stainless steel plates and cylinders	12
6.2.2 Glass cylinders	12
6.2.3 Moulds for forming test pieces	12
6.3 Apparatus and materials for preconditioning and migration procedure	12
6.3.1 Vessels, containers, covers, connectors and stoppers	12
6.3.2	13
6.3.3	13
<b>7 Samples and test pieces</b>	<b>13</b>
7.1 Sampling, transport and storage of samples	13
7.2 Preparation of test pieces	13
7.2.1 General	13
7.2.2 Factory made pipes, fittings and storage systems	13
7.3 Surface area-to-volume ratio (S/V) for use in the test procedure	14
7.3.1 General	14
7.3.2 Pipes and fittings	14
7.3.3 Storage systems (cement mortar, cement mortar lined or concrete)	14
<b>8 Pre-treatment of samples (curing, preconditioning and disinfection)</b>	<b>14</b>
8.1 General	14
8.2 Curing	14
8.3 Preconditioning	14
8.3.1 General	14
8.3.2 Preconditioning without disinfection treatment	15
8.3.3 Preconditioning with disinfection treatment	15
<b>9 Test procedure</b>	<b>15</b>
9.1 General	15
9.2 Preparation of migration water for analysis of substances	15

9.2.1	Migration procedure	15
9.2.2	Second and third migration periods	16
9.2.3	Additional migration periods	16
9.3	Control samples (blank test)	16
<b>10</b>	<b>Analysis</b>	<b>16</b>
<b>11</b>	<b>Calculation of test results</b>	<b>16</b>
11.1	Calculation of the concentration of the substances in the migration water	16
11.2	Calculation of the migration rate of the measured substances	17
11.3	Calculation of the mean migration rate	17
<b>12</b>	<b>Test report</b>	<b>17</b>
12.1	General information	17
12.2	Information on the product	17
12.3	Information on the test procedure	18
12.4	Test results	18
<b>Annex A (normative) Additional procedures for testing factory made pipes (cement mortar lined and concrete)</b>		<b>19</b>
A.1	Sampling, test piece preparation and storage	19
A.1.1	Sampling	19
A.1.2	Test piece preparation and storage	19
A.2	Surface area to volume (S/V) ratio	22
A.3	Pretreatment of test pieces (preconditioning and disinfection)	22
A.4	Test procedure	22
A.4.1	Migration procedure at 23 °C	22
A.4.2	Migration procedure at elevated temperature	22
A.5	Expression of results	23
A.6	Reporting	23
<b>Annex B (normative) Additional procedures for testing factory made fittings (cement mortar lined and concrete)</b>		<b>24</b>
B.1	Sampling, test piece preparation and storage	24
B.1.1	Sampling of Factory made fittings	24
B.1.2	Test piece preparation and storage	24
B.2	Surface area to volume (S/V) ratio	27
B.3	Pre-treatment of test pieces (preconditioning and disinfection)	27
B.4	Test procedure	28
B.4.1	Migration procedure at 23 C	28
B.4.2	Migration procedure at elevated temperature	28
B.5	Expression of results	28
B.6	Reporting	28
<b>Annex C (normative) Additional procedures for testing factory made storage systems (cement mortar, cement mortar lined and concrete)</b>		<b>29</b>
C.1	Sampling, test piece preparation and storage	29
C.1.1	Sampling	29
C.1.2	Test piece preparation and storage	29
C.2	Surface area to volume (S/V) ratio	32
C.3	Pretreatment of test pieces (preconditioning and disinfection)	32
C.4	Test procedure	32
C.4.1	Migration procedure at 23 °C	32
C.4.2	Migration procedure at elevated temperature	32
C.5	Expression of results	32
C.6	Reporting	32
<b>Annex D (informative) Examples of typical test pieces and test conditions as a function of S/V ratio</b>		<b>33</b>

D.1	General	33
D.2	Pipes and fittings	33
D.3	Test pieces to which a cylinder of stainless steel or glass is to be attached	34
D.4	Square test plates coated with mortar	35
D.5	Moulded test pieces where all faces are exposed to test water	35
<b>Annex E (informative) Test arrangements for testing factory made cementitious products</b>		<b>38</b>
<b>Annex F (normative) Additional procedures for testing factory made cementitious products at elevated temperature</b>		<b>45</b>
F.1	General	45
F.2	Test procedure at elevated temperature	45
F.2.1	General	45
F.2.2	Preparation of migration water for the assessment of migration of substances	45
F.3	Control samples (blank test)	45
F.4	Expression of results	45
F.5	Reporting	45
<b>Annex G (informative) Discrimination between porous and non-porous coatings on factory made products</b>		<b>46</b>
G.1	Principle	46
G.2	Apparatus	46
G.2.1	stainless steel plates	46
G.2.2	cylinders	46
G.2.3	pH meter	46
G.3	Materials and reagents	46
G.3.1	sealing compound/sealant	46
G.3.2	demineralized water	46
G.4	Test procedure	46
G.4.1	General	46
G.4.2	Laboratory blank	46
G.4.3	Coated product	47
G.5	Determination of pH	47
G.6	Expression of results	47
G.7	Classification criteria	48
<b>Annex H (informative) Schematic description of the test procedure</b>		<b>49</b>
H.1	Preconditioning	49
H.2	Production of migration water at 23 C	50
H.3	Typical Schedule	51
H.3.1	Preconditioning	51
H.3.2	Production of migration waters	51
<b>Annex I (informative) Procedural tests using standard additions (positive controls)</b>		<b>52</b>
<b>Bibliography</b>		<b>53</b>