

Migration of heavy metals according to NKB

(1 Appendix)

Object

One model of Water unit forwarded by the client.

Sample identification: Art no 2120012 Water unit CE5,
with covered thread

Date of arrival at SP: 2018-01-22

Date of testing: Week 5-8, 2018

Assignment and method

Migration of lead and cadmium according to *NKB 9 Januari 1990/NKB 12 Oktober 1989/NKB 13 Oktober 1989/NKB 18 Februari 1990, Sect. 3.3.2* (10 days method). According to the leaching test procedure, the samples were exposed to synthetic tap water (demineralized water with addition of NaCl, Ca(OH)₂ and Na₂SO₄).

The metal determination was performed by inductively coupled plasma-optical emission spectrometry (ICP-OES). Before the test, the samples were connected to a water supply system and a water-flow during at least one hour.
The internal threads were covered with plastic couplings.

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Requirements

The requirements for NKB are summarized in Table 1 and Table 2

According to the requirements in (NKB 9/12/13/18 point 2.3.2) the quantity of migrated cadmium shall be ≤ 2 $\mu\text{g/day}$. The requirement for the mean value (day 9 and day 10) of migrated lead depends on size.

According to new Swedish requirements the mean value (day 9 and day 10) of migrated lead has been adjusted and the requirement for the mean value depends on the size. This requirement comes into force 1 July 2017, until then the old requirement can be applied.

Table 1 Requirements according to NKB 12/18. The new requirement comes into force 1 July 2017

	Old requirement		New requirement	
	DN 15	DN 28	DN 15	DN 28
Couplings				
Cadmium ($\mu\text{g/day}$)	≤ 2.0	≤ 2.0	≤ 2.0	≤ 2.0
Lead ($\mu\text{g/day}$)	≤ 5.0	≤ 20.0	≤ 2.7	≤ 5.0

Table 2 Requirements according to NKB 9/13. The new requirement comes into force 1 July 2017.

	Old requirement		New requirement	
	DN 15	DN 25	DN 15	DN 25
Valves				
Cadmium ($\mu\text{g/day}$)	≤ 2.0	≤ 2.0	≤ 2.0	≤ 2.0
Lead ($\mu\text{g/day}$)	≤ 10.0	≤ 20.0	≤ 3.0	≤ 5.0

The new limit value for lead can be calculated according to the following formula:

Formula NKB 12/18 $5/28 \times \text{diameter of the coupling} = \text{limit value}$

Formula NKB 9/13 $5/25 \times \text{dimension} = \text{limit value}$

Results

The tests were carried out on three specimens.

Table 3 Migration of cadmium from three replicates

Sample	Volume (L)	Day 9 Cadmium, Cd (µg/L)	Day 9 Cadmium, Cd (µg/day)	Day 10 Cadmium, Cd (µg/L)	Day 10 Cadmium, Cd (µg/day)
Art no 2120012 Water unit CE5	0.02	<3	<0.3	<3	<0.3

Table 4 Migration of lead from three replicates

Sample	Volume (L)	Average Day 9 & Day 10 Lead, Pb (µg/L)	Average Day 9 & Day 10 Lead, Pb (µg/day)
Art no 2120012 Water unit CE5	0.02	81	1.6

Table 5. Migration of nickel calculated from three replicates.

Sample	Volume (L)	Average Day 9 & Day 10 Nickel, Ni (µg/day)
Art no 2120012 Water unit CE5	0.02	1.1



Picture 1 Art no 2120012 Water unit CE5

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Appendix: Measurement uncertainty