NSF/ANSI 61
Drinking water system component – health effects

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3.2 Information and formulation requirements

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– complete formulation information for each water contact material as applicable'

NOTE – The complete formulation information may be omitted for a component material if the generic material type is contained in Table 3.1 and its diluted surface area in the application is less than or equal to 0.001 in^2/L or 0.0001 in^2/L for static or flowing conditions respectively. If the product is to be considered compliant to a lead content standard, the lead content (percent by weight) and wetted surface area of each component that comes into contact with the direct flow of water under the normal operation of the product is required. Complete documentation shall be submitted in accordance with the annex G.

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3.5 Restriction on use of lead containing materials

There shall be no lead added as an intentional ingredient in any product, component, or material submitted for evaluation to this standard, with the following exceptions:

- Brass or bronze meeting the definition of "lead free" under the specific provisions of the Safe Drinking Water Act of the United States.
- Trace amounts required for operation of products used to monitor the characteristics of drinking water, such as the glass membranes used with some selective ion or pH electrodes.
- Materials of components with a diluted surface area less than or equal to 0.0001 in^2/L.

Note – To the maximum extent possible, lead should not be added as an intentional in any product covered by the scope of this standard. The exception above relative to the diluted surface area has only been included in recognition of formulation information exemption for applications with this condition.

3.6 Weighted average lead Content of Products

Products being evaluated for weighted average lead content shall be evaluated in accordance with annex G.

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Annex G
(normative)

Weighed average lead content evaluation procedure to a 0.25% lead requirement

G.1 General

This is an optional evaluation method for products that need to meet a 0.25% weighted average lead content standard. Certification of products to this annex shall be noted in the certification listing.

Products deemed to comply with the requirements of this section shall also comply with the full requirements of NSF/ANSI Standard 61.

G.2 General Evaluation Protocol

G.2.1 All components ≤0.25%

If each component of a product has a wetted surface with a verifiable lead content of not more than 0.25%, then the product is considered compliant with the requirements of this annex and no further evaluation is required.

G.2.2 Some components ≥ 0.25%

If some wetted components of a product contain more than 0.25% lead, then the weighted lead content shall be calculated according to G.3 to determine compliance with the requirements of this annex.

G.3 Weighted average lead content calculation

The weighted average lead content of the product can be calculated using information that is provided as part of the manufacturer's submittal under section 3.2. For internal threaded products, the wetted surface area shall include 25% of the threaded area(s).

All of the wetted surfaces are to be included in the weighted average lead content calculation, not just those surfaces that contain lead. If the weighted average lead content is greater than 0.25%, the manufacturer can replace wetted components containing lead with non-lead materials until the weighted average lead content is less than or equal to 0.25%.

G.3.1 Formula for determining weighted average lead content

The following formulation shall be used when calculating the weighted average lead content of products:

$$WLC = \sum_{c=1}^{n} \left(LC_c \times \left[\frac{WSA_c}{WSA_t} \right] \right)$$

where;

WLC	=	weighted average lead content of product
LC_c	=	percentage lead content of component
WSA_c	=	wetted surface area of component
WSA_t	=	total wetted surface area of all components
n	=	number of wetted components in product

Note – Formula derived from example calculation proved by R. Sykes. An example calculation of the weighted average lead content of a product is provided in section G.5

G.4 Lead content of water contact surfaces

The lead content of the material specification used to produce wetted components shall be used to determine compliance with this standard. For lead contents of materials that are provided as a range, the maximum content of the range shall be used.

G.4.1 Use of Liners: When lead-bearing surfaces have been excluded from water contact by use of a rigid liner (e.g. plastic sleeve) sealed with a permanent barrier, the lead content of the liner shall be used.

G.4.2 Use of coatings: When coatings are used, the lead content of the coated substrate shall be used in the calculation of weighted average lead content.

G.4.3 Use of lead removal technologies: For components where the wetted surface areas have been treated with a lead removal technology, the percent lead composition shall be based on the material used to manufacture the component prior to application of the surface treatment.

G.5 Example weighted average lead content calculation

The following is an example of how this weighted average lead content calculation is conducted.

1. Identify those components of the faucet that water flows through and comes into contact with during the normal operation (wetted components).

2. Use the percentage of lead content within each component (supplied by the component manufacturer or supplier). Table G1 – column 4 provides the lead content for each of the wetted components.

3. Determine the percent of total wetted surface area represented in each component using the part specifications.

a. The *wetted surface area* of each component that comes into direct contact with water is required under 3.2 (to be provided by the manufacturer). Table G1 - column 2 shows the *wetted surface area* of the subject faucet.

b. Add the areas of the wetted surface for each component together: this is the *total wetted surface area of the faucet*.

c. For each component, divide the *area of its wetted surface* by the *total wetted surface area of the faucet (times 100)*: this is the percent of total wetted surface area of each component (see Table G1 – column 3).

$$\text{Percent wetted surface area} = \frac{\text{Wetted surface area of component}}{\text{Total wetted surface area}} \quad x \quad 100$$

4. For each component, multiply the percentage of lead content by the percent of total wetted surface area of that component: this is the *contributing percent lead for each component* (see Table G1 – column 5).

Contributing percent lead = (Percent wetted surface area / 100) x (Percent lead content / 100) x 100

5. Calculate the weighted average lead content of the faucet by totaling the *contributing percent lead for the components that make up the wetted surface* of the faucet (Table G1 – column 5). For the faucet to be in compliance with this annex, this total must be no more than 0.25%.

Table G1. Example of weighted average lead content calculations.

1	2	3	4	5
Component No.	**Wetted surface area[1] (total = 61.94 in^2)**	**% wetted surface area (total = 100%)**	**% lead content**	**Contributing % lead**
1	17.31	27.95	0.05	0.01
2	1.15	1.85	2.86	0.05
3	4.99	8.05	0.23	0.02
4	18.25	29.46	0.05	0.01
5	11.14	17.98	0	0.00
6	4.02	6.49	0	0.00
7	1.09	1.75	1.30	0.02
8	0.54	0.87	0	0.00
9	0.91	1.48	2.54	0.04
10	0.76	1.23	0	0.00
11	1.02	1.64	2.54	0.04
12	0.35	0.56	2.54	0.01
13	0.43	0.69	2.54	0.02
			Weighted average lead content =	**0.23%** **(in compliance)**