RECOMMENDATIONS ON THE CRITERIA

FOR AWARDING ENVIRONMENTAL LABEL TO BATHROOM FIXTURE PRODUCT GROUP

ARTICLE 1 - These criteria have been prepared in accordance with the Environmental Labeling Regulation published in the Official Gazette dated 19.10.2018 and numbered 30570.

ARTICLE 2 - The Criteria for Bathroom Fixtures Product Group mainly cover household taps, shower heads, and showers used primarily for obtaining water for personal hygiene, cleaning, cooking, and drinking purposes, including both domestic and commercial (non-domestic) use.

These criteria do not cover the following products:

a) bathtub taps
b) double-handle showers
c) sanitary tapware developed for special purposes

ARTICLE 3 – According to the Environmental Labeling Regulation, products within the scope of the bathroom fixtures product group must meet the specified Environmental Labeling criteria in order to be eligible for an Environmental Label.

ARTICLE 4 – The evaluation and verification requirements for the Environmental Label criteria established for the bathroom fixtures product group will be valid for five years. Within this five-year period, the criteria may be updated or the validity period of the criteria may be extended by the Environmental Labeling Board when deemed necessary.

ARTICLE 5 – If there is documented evidence that an accredited laboratory is not available for mandatory tests within the scope of evaluation and verification requirements, accreditation according to TS EN ISO/IEC 17025 is not required.

RECOMMENDATIONS ON THE CRITERIA

The criteria for granting an Environmental Label for the Bathroom Fixtures product group are as follows:

1. Water consumption and related energy savings
2. Materials in contact with drinking water
3. Excluded or restricted substances and mixtures
4. Product quality and longevity
5. Product packaging
6. User information
7. Information included in the environmental label

Assessment and verification requirements are specified for each criterion.

EVALUATION AND VERIFICATION REQUIREMENTS

Each specific evaluation and verification requirement for each criterion is separately specified under each criterion. In cases where the applicant is requested to provide declarations, documents, analyses, test reports, or other evidence to demonstrate compliance with the criteria, these can be obtained from the applicant and/or their supplier(s) and/or their suppliers' suppliers, etc., as appropriate.

The Ministry recognizes tests conducted by laboratories accredited by an accreditation body that is a signatory to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) according to TS EN ISO/IEC 17025[1]. (Access to the list of organizations accredited by TÜRKAK can be obtained from the address "https://secure.turkak.org.tr/kapsam/search.") If there is documented evidence that there is no accredited laboratory for mandatory tests under the assessment and verification requirements, accreditation according to TS EN ISO/IEC 17025 is not required.

Where necessary, if the Ministry accepts the equivalence of test methods, different test methods than those specified for each criterion can be used.

Where necessary, the Ministry may request supporting documents and conduct independent verifications and on-site visits.

As a precondition, the product must meet all relevant legal requirements of the country where the product is intended to be placed on the market. The applicant declares that the product complies with these requirements.

[1] General requirements for the competence of testing and calibration laboratories

RECOMMENDATIONS ON THE CRITERIA AND REQUIREMENTS

CRITERION 1. Water consumption and related energy savings

Criterion 1(a). Maximum usable water flow rate

Regardless of water pressure, the current maximum water flow rates of sanitary faucet sets should not exceed the values presented in Table 1. Use of a flow restriction device is a requirement.

Table 1. Maximum water flow rate limits for bathroom fixtures

Product subgroup		Water flow rate [l/min]
Kitchen Faucets	With flow restriction device	5,0
Bathroom Faucets	With flow restriction device	5,0
Shower heads ([1])		9,0
Showers ([1])		6,0

(1) Shower heads and showers with multiple spray settings must comply with the requirement for the highest water flow rate setting.

Assessment and verification: The applicant must declare the conformity of the product to the requirement and specify the maximum water flow rate of the product (in l/min) along with the results of tests conducted in accordance with the relevant TS standards for the product type, as part of the labeling procedure (see Table 2).

Tests for products claimed to be suitable for high-pressure installations (typically 1.0 to 5.0 bar) should be conducted at pressures of 1.5; 3.0; and 4.5 bar (± 0.2 bar), or for products claimed to be suitable for low-pressure installations (typically 0.1 to 0.5 bar), at pressures of 0.2; 0.3; and 0.5 bar (± 0.02 bar). The average value of the three measurements must not exceed the maximum flow rate values specified in Table 1. For sink faucets and kitchen faucets with split outlets, the water flow rate should be the sum of the two flows, i.e., the total flow from the hot and cold water taps to the sink or basin. Additionally, for products with the option of a flow restriction device, a description of the device applied (i.e., its main technical parameters, and installation, adjustment, and usage instructions) must be provided.

Table 2. Standards for bathroom fixtures

Number	Title
TS EN 200	Bathroom fittings - Taps and mixers for type 1 and type 2 water supply systems - General technical specifications
TS 266	Water intended for human consumption
TS EN 816	Bathroom fixtures - Automatic shut-off valves PN 10
TS EN 817	Bathroom fixtures - Mechanical mixing faucets (PN 10) - General technical specifications
TS EN 1111	Bathroom fixtures - Thermostatic mixing valves (PN 10) - General technical specifications
TS EN 1112	Bathroom fixtures - Shower heads for type 1 and type 2 water supply systems - General technical specifications
TS EN 1286	Bathroom fixtures - Low-pressure mechanical mixing faucets - General technical specifications
TS EN 1287	Bathroom fixtures - Low-pressure thermostatic mixing valves - General technical specifications
TS EN 15091	Bathroom fixtures – Electronically turned on and off
TS EN 248	Bathroom fixtures - Electrolytic chrome-nickel coatings - General technical specifications
TS EN IEC 60335-1	Safety rules - Part 1: General rules for electrical appliances used in households and similar purposes
TS EN 60335-2-35	Safety rules - Part 2-35: Special requirements for instantaneous water heaters (IEC 60335-2-35:2012, modified)

Criterion 1(b). Minimum available water flow rate

The minimum available water flow rates of bathroom fixtures, regardless of water pressure, should not be lower than the values given in Table 3:

Table 3. Minimum available water flow rates for bathroom fixtures

Product subgroup	Water flow rate [l/dak]
Kitchen faucets	1
Bathroom faucets	1
Shower and shower heads	4,5
Electric showers and low-pressure showers (*)	3,0
(*) Products typically marketed as suitable for low-pressure installations, operating between 0.1 to 0.5 bar.	

Assesment and verification: The applicant must declare the conformity of the product to the requirement and specify the minimum maximum water flow rate of the product for the label, along with the results of tests conducted in accordance with the relevant TS standards for the product type (see Table 2).

For products claimed to be suitable for high-pressure installations (typically 1.0 to 5.0 bar), tests should be conducted at pressures of 1.5, 3.0, and 4.5 bar (± 0.2 bar), or for products claimed to be suitable for low-pressure installations (typically 0.1 to 0.5 bar), at pressures of 0.2, 0.3, and 0.5 bar (± 0.02 bar). The average value of the three measurements must not be lower than the water flow value given in Table 3. For faucets designed for dual water outlet, the water flow rate should be the sum of the two flows, i.e., the total flow from the hot and cold water taps to the sink or basin.

Criterion 1(c). Temperature control

Bathroom fixtures must be equipped with an advanced device or technical solution that allows the end user to control the temperature and/or hot water demand by limiting the water temperature or hot water supply through thermostat adjustment.

Alternative means should be integrated to give the user direct control over the temperature of the water coming from the tap or shower, regardless of the heating system to which it is connected. Options such as a temperature limiter, a cold water supply in the middle position and/or a thermostatic mixing valve can be considered

Sanitary faucets and shower heads designed to be attached to a hot water source with temperature control are exempt from this criterion.

Assesment and verification: In the application submitted to the Ministry, the applicant must declare that the product meets the requirement and provide documents explaining the technology or device used in

the product. In cases where the water source is already temperature-controlled, the applicant must explain the technical feature that makes the plumbing fixture compatible with such a system.

Criterion 1(d). Time control

This criterion applies to plumbing fixtures sold or marketed with time control devices. Products that provide time control include devices

- that stop water flow after a certain period of non-use (sensor devices)
- time limiters that stop water flow when the maximum flow time is reached.

For plumbing fixtures with a time limiter, the maximum flow time should not exceed 15 seconds for faucets and 35 seconds for showers. Additionally, the design should allow the flow time to be adjusted during installation according to the product's use.

For sensor-based plumbing fixtures, the closing delay time after use should not exceed 1 second for faucets and 3 seconds for showers. Furthermore, sensor-based plumbing fixtures should have an internal 'safety technical feature' set to a maximum 2-minute shut-off time to prevent water wastage from faucets or showers in case of an accident or when not in use.

Assesment and verification: The product or system should be tested within the specified pressure range (3.0 bar (± 0.2 bar) for high-pressure valves or 0.5 bar (± 0.02 bar) for low-pressure valves) to confirm that the time control closes within 10% tolerance of what is specified by the applicant. The applicant must declare that the product meets the requirement and specify the type of solution used, including technical parameters (pre-set water flow time for time limiters, closing delay time after use for sensors), and submit the results of a test conducted in accordance with TS EN 15091 for electronic opening and closing plumbing fixtures or TS EN 816 for automatic shut-off valves as part of the application to the authorized body.

CRITERION 2. Materials in contact with drinking water

All surfaces that come into contact with water or are likely to come into contact with water at every stage up to the point where the water is offered for consumption, as well as tools and devices that will be used in contact with water, shall be made of materials that will not impair the quality of the water or harm health. Products used in bathroom fixtures must comply with the Regulation on Water Intended for Human Consumption. They must not cause any deterioration in the quality of water intended for human consumption in terms of appearance, odor or taste. Under the recommended conditions of use (i.e. the conditions of use specified in the relevant TS standards specified in Table 2), the materials shall not undergo any changes that will reduce the performance of the product. Materials that do not have sufficient resistance to corrosion must be adequately protected so that they do not pose a health risk.

Assesment and verification: The applicant must declare that the product meets the requirement and provide the relevant documents or test results as follows:

Metallic materials used in plumbing fixtures in contact with drinking water must be listed in the 'Acceptance of Metallic Materials in Contact with Drinking Water Products' compliance list provided in the annex. The applicant will submit a compliance statement to this requirement. If metallic materials are not listed in this compliance list, test results must be provided in accordance with the approach of 'Adding

a Material to the Composition List Within a Material Category' as described in the annex and using TS EN 15664-1 standard.

CRITERION 3. Restricted substances and mixtures

Criterion 3(a). Hazardous substances and mixtures

The final product must not contain substances that meet the classification criteria with the hazard statements or risk phrases specified below, in accordance with the Regulation on the Registration, Evaluation, Authorization and Restriction of Chemicals (KKDİK).

Tablo 1. List of hazardous substance notifications

Hazard Notification
H300 Fatal if swallowed
H301 Toxic if swallowed
H304 Fatal if swallowed or inhaled
H310 Fatal if in contact with skin
H311 Toxicl if in contact with skin
H330 Fatal if inhaled
H331 Toxic if inhaled
H340 May cause genetic defects
H341 Suspected of causing genetic defects
H350 May cause cancer
H350i May cause cancer if inhaled
H351 Suspected of causing cancer
H360F May damage fertility
H360D May cause harm to the unborn child
H360FD May damage fertility. May cause harm to the unborn child.
H360Fd May damage fertility. Suspected of damaging the unborn child.

H360Df May cause harm to the unborn child. Suspected of damaging fertility.
H361f Suspected of damaging fertility
H361d Suspected of harming the unborn child
H361fd Suspected of damaging fertility and harming the unborn child
H362 May harm breastfed children
H370 Causes damage to organs
H371 May cause damage to organs
H372 Prolonged or repeated exposure causes damage to organs
H373 Prolonged or repeated exposure may cause damage to organs
H400 Highly toxic to aquatic life
H410 Highly toxic to aquatic life with long-lasting effects
H411 Toxic to aquatic life with long-lasting effects
H412 Harmful to aquatic life with long-lasting effects
H413 May cause long-term adverse effects in the aquatic environment
EUH059 Harmful to ozone layer
EUH029 Releases toxic gas when in contact with water
EUH031 Releases toxic gas upon contact with acids
EUH032 Emits highly toxic gas when in contact with acids
EUH070 Toxic by eye contact

*Processed substances or mixtures whose properties have been changed (e.g., those that are no longer biologically available or have undergone chemical modification to eliminate the previously identified hazard) are exempt from the above requirement.

Substances or mixtures that have or have had the hazard statements or risk phrases listed above and meet the classification criteria in hazard classes or categories, and meet the criteria in Article 47 (a), (b), or (c) of KKDİK, shall not exceed the concentration limits established in accordance with Article 10 of

Regulation on Classification, Labeling and Packaging of Substances and Mixtures (SEA). In cases where specific concentration limits are established, these shall take precedence over equivalent limits.

For substances meeting the criteria in Article 47 (d), (e), or (f) of KKDİK, the concentration limits shall not exceed 1% by weight.

The final product should not be labeled according to the hazard statements listed above.

The following substances/components are specifically exempt from this requirement:

Nickel in all types of stainless steel	All hazard statements and risk phrases
Drinking water contact sanitary tapware and homogeneous parts made of alloys that meet the requirements listed in Section B of the 'Acceptance of Metallic Materials Used in Contact with Drinking Water - Common Approach' or will be added to this list in the Annex.	All hazard statements and risk phrases
Nickel in protective coating layer, if the release of nickel from nickel layers or a coating containing nickel on inner surfaces of products which are intended to come into contact with drinking water tested in accordance with EN 16058 (*) standard (**) does not exceed 10 µg/l.	All hazard statements and risk phrases

Assessment and verification: For each article or any homogeneous part of the applicant, the applicant shall submit a declaration of conformity to this criterion, together with relevant documents such as declarations of conformity signed by the suppliers, regarding the non-classification of substances or materials by any hazard. The declaration of conformity shall declare that the product does not contain the hazard codes listed above, in accordance with the KKDİK Annex 7 list and SEA. This declaration shall be supported by summary information on the relevant properties associated with the hazard statements referred to in the above list, at the level of detail specified in sections 10, 11 and 12 of Annex II of the KKDİK (Requirements for the Compilation of Safety Data Sheets).

Information on the intrinsic properties of substances may be obtained by means other than testing, for example by the use of artificial methods such as laboratory methods, quantitative models or by grouping or read-across in accordance with Annex 11 of the KKDİK.

The provided information should relate to the forms or physical states of the substances or mixtures used in the final product.

For substances listed in Annex IV and V of KKDİK and exempted from registration obligations under Article 7 of KKDİK, such a statement will be sufficient to comply with the requirements mentioned above.

Criterion 3(b). Substances listed under KKDİK

No exceptions will be made for substances included in the list foreseen in Article 49 of the KKDİK, defined as substances of very high concern, present in mixtures, in an article or in any homogeneous part of a

complex article at concentrations greater than 0.1%. In cases where the concentration is lower than 0.1%, specific concentration limits determined in accordance with Article 10 of the SEA will be applied.

Assesment and verification: The list of substances identified as substances of very high concern and included in the candidate list under Article 49 of KKDİK can be found on the ECHA website [2].

The applicant will refer to the list on the date of application. The applicant shall submit a conformity statement, along with relevant documents such as compliance statements signed by material suppliers and copies of Safety Data Sheets for substances or mixtures, in accordance with Appendix II of SEA, to demonstrate compliance with this criterion. Concentration limits will be specified in Safety Data Sheets for substances and mixtures in accordance with Article 31 of SEA.

CRITERION 4. Product quality and longevity

Criterion 4(a). General requirements

The product must comply with the general requirements of the relevant TSE standards listed in Table 2 or the relevant mandatory national legal regulations. The requirement regarding water flow rates is excluded from this criterion.

Where applicable, cleaning of product components that may be necessary under normal conditions of use should be possible using simple tools or materials.

Criterion 4(b). Surface contact and coating quality

A sanitary product with a metallic Ni-Cr coating (regardless of the substrate material) must comply with the TS EN 248 standard.

Criterion 4(c). Repair and spare parts

The product should be designed so that its interchangeable components can be easily replaced by the end user or a suitably qualified professional service engineer. Information about which elements can be replaced should be clearly stated in the attached information sheet. The applicant will also provide clear instructions to enable end users or appropriately trained experts to carry out basic repairs.

Furthermore, the applicant will ensure the availability of spare parts for at least 7 (seven) years from the end of production.

Criterion 4(d). Warranty

The applicant shall provide at least a 2-year warranty on photocell products and a 5-year warranty on showers and shower heads for repair or replacement.

Assesment and verification: The applicant must declare that the product complies with these requirements and must submit samples of the product information form and warranty terms to the ministry as part of the application.

[2] https://echa.europa.eu/candidate-list-table

With regards to clauses (a) and (b), the applicant must also submit to the ministry, as part of the application, the results of tests conducted in accordance with the standards listed in Table 2 for clause (a) and TS EN 248 for clause (b).

CRITERION 5. Product Packaging

Packaging used for bathroom faucets must meet the following requirements:

(a) all packaging components should be easily separated by hand into individual materials to facilitate recycling and must be made out of recyclable material.,

(b) cardboard packaging should be consist of at least 80% recycled material,

(c) transparent packaging should be used at least 50% recycled material,

(d) contains plastics that can be stored back in plastic packaging. (Features such as PVC, PS, EPS should not be used.)

Assesment and verification: The applicant must declare that the product complies with the requirements and must submit a sample/examples of the packaging to the authorized body as part of the application.

CRITERION 6. User information

User information accompanying the product should include relevant advice on its correct and environmentally friendly use, as well as maintenance. The following information should be available in printed form on the packaging and/or in documents accompanying the product or in electronic format:

(a) The main environmental impact is related to the product's use phase, i.e., its water and energy consumption for water heating, along with advice on how sensible use can minimize environmental impact.

(b) Logo or informational text indicating that the product has been awarded the Turkish Environmental Label.

(c) Maximum flow rate in liters per minute (tested as specified in Criterion 1(a)).

(d) Installation and assembly instructions, including information on specific operating pressures for which the product is suitable.

(e) Recommendations regarding water stagnation for faucet products and a relevant warning not to drink faucet water after a long period of stagnation, for example: "To prevent wasting drinking water, use stagnant water (such as water that has not been used for a long time, such as in the mornings or after holidays) for purposes such as flushing toilets, showering, or watering gardens."

(f) Relevant advice on correct use and maintenance, including cleaning and limescale maintenance, particularly mentioning all relevant instructions.

- (i) Recommendations for the maintenance and use of products,
- (ii) Information on spare parts replacement,
- (iii) Instructions for replacing seals if faucets drip,
- (iv) Recommendations for cleaning sanitary faucet sets with appropriate materials to prevent damage to their inner and outer surfaces,
- (v) Recommendations for the regular and proper maintenance of flow limiting devices.

The product page should include information stating that compatibility should be checked when using "low-flow shower heads" with an electric shower. For example, 'if you plan to use an electric shower, please check if this low-flow shower head is compatible with your current shower system.'

Assesment and verification: The applicant must declare that the product complies with the requirements and must provide to the ministry a sample or samples of user information, and/or provide a link to a manufacturer's website containing this information as part of the application.

CRITERION 7. Information Included in the Environmental Label

The instructions for using the label can be found in the "Environmental Label Usage Guide" section of the website.

https://webdosya.csb.gov.tr/db/cevreetiketi/icerikler/cevre-et-ket--kullanim-kilavuzu-20221206090300.pdf

The text box optional label should contain the following text:

- More efficient water use

- Increased energy saving potential

- Save water, energy, and money with this Eco-labeled product

Assesment and verification: The applicant will submit a sample of the product label or a visual of the packaging with the Environmental Label placed on it along with the compliance declaration to this criterion.

ANNEXES

The following information is based on the report "Acceptance Of Metallic Materials Used For Products in Contact With Drinking Water." Section A - Acceptance Procedure and Section B - Common Composition List. https://www.umweltbundesamt.de/sites/default/files/medien/5620/dokumente/ca_mm_part_a_-_methodologies_for_testing_and_accepting_compositions_july_2021_rev04_version_2.pdf

Annex-I. Acceptance Of Metallic Materials Used For Products in Contact With Drinking Water. 1. Paragraph WATER FOR DRINKING. Common Approach. Section A. Acceptance procedure presented in Section 2.

1. Acceptance of metallic materials in the Composition List

Metallic materials used in products in contact with drinking water must be listed in the Composition List.

1.1. Procedure for adding materials to the Composition List

The primary responsibility for the evaluation of materials will remain at the national level, utilizing established processes and expert resources. However, interpreting test results and applying the acceptance criteria described below can be complex. Therefore, a Committee may provide recommendations in the decision-making process.

The Committee should have the following expertise:

- Competence in corrosion and metal release

- Competence in toxicology and evaluation of drinking water quality for human health

- Understanding of the ways in which metallic materials and products are used in drinking water treatment and supply

A group consisting of 4 Member States has agreed on a common procedure to accept materials in a common Composition List. This procedure is described in Section B of this document.

1.2. Structure of the Composition List

The Composition List includes different categories of metallic materials.

A category is defined as:

A group of materials with the same properties in terms of their behavior in contact with drinking water and any limitations related to water composition and/or surface area.

The Composition List contains the composition variants of categories. Each category has a reference material.

A reference material is defined as:

A material that falls into a category where the characteristics of metal release into drinking water are known and reproducible, the composition is strictly controlled, and the levels of the elements of interest

will be at or near the limits of acceptability. Possible effects of some components should be considered to prevent metal release.

For each category, a list of commercially available metallic materials accepted for use in all products in contact with drinking water will be provided. Materials can only be used for certain products due to limitations related to surface area (Table 5).

Table 2. Product groups for metallic materials

Product Group	Examples of products or product components	Default contact surface 'a'
A	Building plumbing Uncoated pipeline systems in water supply systems	%100
B	Fittings and accessories for connection elements Pump parts in building installations Parts of valves in building installations	%10
C	1. Components of products belonging to group B (e.g., the shaft of a pump or the moving parts of a water meter in building installations). The total contact surface with drinking water of all these components should be less than 10% of the total wetted surface area of the product. 2. Connection components and auxiliary equipment in water networks and continuous flow water treatment works (e.g., pump bodies used in water supply systems, valve bodies).	%1
D	Components of connection parts and auxiliary components in water networks and water treatment works (C2).	

— Product Group A: Up to 100% contact surface

For pipes in a building installation, the same material can be used for all diameters. A single material, such as copper, galvanized steel, or stainless steel, can contribute to nearly 100% of the surface in contact with water. The maximum percentage possible should be considered when assessing safe use conditions. The acceptance of a composition for use as a pipe includes acceptance for all uses (e.g., fittings, components, etc.).

This group also includes uncoated metallic pipeline systems in water supply systems and water treatment processes.

— Product Group B: Up to 10% contact surface

Additional parts or ancillary products in a building's installation can be made from a composition or slightly different compositions. The most common ones are made from copper alloys. Since products made from these alloys have the potential to leach metals (e.g., lead) into water, there is a need to limit the total

surface contact of products made from these alloys. For these products, a 10% contribution to the surface contact area of water is assumed for composition evaluations.

This group also includes the main metal parts of pumps and valves used in building installations.

— Product Group C: Less than 1% contact surface

For technical reasons, it may be necessary to produce small parts from compositions not accepted for Group B. Other compositions with higher leaching rates may be acceptable if their use does not significantly increase the total pollution of drinking water. The use of such compositions should be limited to parts (in total) that do not exceed 1% of the total surface in contact with drinking water; for example, the body of a water meter should be made from a composition accepted for Group B, but a moving part can be made from a composition listed for Group C. In a product made from Group C compositions, the total surface area of all parts in contact with drinking water should be less than 10%.

This group also includes the main metal parts of components used in water mains and water treatment plants. For these products, continuous flow of drinking water must be ensured.

— Product Group D: Insignificant contact surface

Pipeline components in water mains and water treatment plants (C2). In a product made from Group D compositions, the total surface area of all parts in contact with drinking water should be less than 10%. Continuous flow of drinking water must be ensured for these products.

1.3. Required data for assessment

The acceptance of metallic materials is based on the results of long-term tests on a test rig according to TS EN 15664-1. The minimum test duration is six months and this duration can be extended. Additional requirements for testing are described in 1.4 and 1.5 of EN 15664-1.

Acceptance of a reference material for a category requires acceptance of the results obtained from the TS EN 15664-1 test conducted with different waters representing the normal composition range of drinking waters in Turkey (see TS EN 15664-2).

To add a material to a category, a comparative test against the reference material using TS EN 15664-1 must be conducted. For the comparative test, it is sufficient to use a local drinking water provided that the water is appropriately corrosive (see TS EN 15664-2).

The following information needs to be provided:

- Test reports according to TS EN 15664-1

- Test reports for the composition of the test sample

- Information on limits for main alloying elements and maximum values for impurities for each composition. These limits are narrower than those for commercial alloys for Reference Materials.

- Current relevant European standard(s) for the material

- Material properties

- Products to be produced from the material and their areas of use

- Production process

- Other information deemed appropriate to support the assessment

1.4. Properties of the test sample

According to TS EN 15664-1, test samples must have a specific composition.

For each element exceeding 0.02% by weight, the composition of the material must be declared. For impurities below 0.02%, it is the responsibility of the manufacturer of the alloys/materials to ensure that no releases with the potential to cause adverse health effects occur.

The composition of the test samples should be as follows:

1.4.1. Reference Material

The test samples presented for the testing of a new reference material and the test samples used as reference material for the comparative test must meet the following requirements:

- Components and impurities should be within the declared range.

Note: The composition of the reference material must be accepted before the test begins. The composition range should be very narrow and the reference material should represent the material in the worst case scenario for concerning metal leaching for the category.

1.4.2. Candidate materials for the comparative test

The composition range and allowable impurities for candidate materials should be defined. The comparative test is possible if the candidate material conforms to the defined composition range of an existing material category.

The composition of the test samples used for the test should be more restricted than the defined composition range of the material. Based on information about copper alloys, the composition of the test samples should meet the following requirements:

Components:

- The components should be within the declared range for Cu and Zn.

- The content declared as a component should be greater than 66% of the declared range. (For example, if the declared range is ≤ 0.15%, 66% (0.15%) of the range is 0.10%, so the element content should be between 0.10% and 0.15%.)

- Al, Si, and P should be less than 50% of the declared range.

- For all other components, the content should be greater than 80% of the declared range. (For example, if the declared range is 1.6% to 2.2%, 80% (0.6%) of the range is 0.48%, so the element content should be greater than 2.08%.)

Impurities:

- Impurities to be analyzed in contact water (see 1.5) should exceed 60% of the declared maximum content. Requirements may vary for non-copper alloys.

1.5. Water Analysis

If a new reference material is tested, according to EN 15664-1, the contact water should be analyzed for all elements exceeding 0.02% in the declared composition of the material:

- If present as a component: Sn, Si, and P

- If present as impurities in the alloy: Fe, Sn, Mn, Al, Si, and P

The analysis of contact water for comparative tests can be limited to specific elements specified in the composition list for each category.

1.6. Acceptance criteria

Table 2 suggests acceptable contributions from all products in contact with drinking water to the general concentrations of metals in consumers' taps. These acceptable contributions are based on the chemical and indicative parametric values in the Regulation on Waters Intended for Human Consumption. The acceptable contributions have been derived using the following principles:

- For elements where 90 of all products in contact with drinking water constitute the single significant source of contamination;

- For elements where 50 constitute the possible contamination sources.

When other parameters not listed in the Regulation on Waters Intended for Human Consumption are considered, the following criteria have been used:

- Zinc: This element is not toxic at concentrations encountered in water supply systems using galvanized steel pipes. However, zinc can lead to complaints regarding the taste and appearance of water. The proposed reference value is determined to ensure that zinc does not reduce the aesthetic acceptability of water (WHO, 2004).

- Tin, bismuth, molybdenum, titanium: These reference values are based on temporary values recommended by a toxicology expert (Fawell, 2003).

- Other metals: When necessary, advice will be sought from toxicology experts for an appropriate reference value.

It is recommended that the test procedure simulate a conditioning period of three months, allowing time for the development of natural protective layers and tolerating a slight mismatch with the reference concentration.

Table 6. Acceptable contributions and reference concentrations for metallic components of all products in contact with drinking water

Parameter	Acceptable contribution from all metallic products in contact with drinking water	*Regulation on Human Consumption Waters or recommended reference value in DW (µg/l)*	Reference concentration for acceptance program 'RC' (µg/l)
Section B: Chemical parameters			
Antimonyy	50 %	5	2,5
Arsenic	50 %	10	5
Chromium	50 %	50	25
Cadmium	50 %	5	2.5
Copper	90 %	2 000	1 800
Lead	50 %	10	5
Nickel	50 %	20	10
Selenium	50 %	10	5
Section C: Indicator Parameters			
Aluminum	50 %	200	100
Iron	50 %	200	100
Manganese	50 %	50	25
Others: Not listed in the Regulation on Human Consumption Waters			
Bismuth	90 %	10	9
Molybdenum	50 %	20	10
Tin	50 %	6 000	3 000
Titanium	50 %	15	7.5
Zinc	90 %	3 000	2 700

1.7. Adding a Reference Material for a Material that does not belong to a Category or listed Category

Adding an alloy element or changing its range can move an alloy outside of a Category, significantly affecting its metal release properties. In such cases, and for an alloy representing a Category (Reference Material), the following information should be provided:

— Information listed in 1.3

— When the proposed new composition cannot be compared to a listed material category, full test results from EN15664-1 for pipe fittings testing using at least three different drinking waters as described in EN15664-2 must be provided.

1.7.1. Acceptance Rate of Reference Material

The arithmetic mean of the equivalent pipe concentrations for the test rig results (as per EN 15664-1) will be considered for evaluation, denoted as MEPn(T).

For all exposure periods (T), the average MEPn(T) of the three test lines in an apparatus is calculated: MEPa(T). The material is acceptable for a product group with a default contact surface area of a (see Table 1) if:

(I) MEPa(T) * a ≤ RC for T = 16, 21, and 26 weeks

(II) MEPa(Tb) ≥ MEPa(T) for {Tb, T} = {12, 16}, {16, 21}, and {21, 26} weeks

for all tested drinking waters.

If criterion II is not met, the test can be extended up to 1 year. In this case, the material can be considered acceptable if:

(III) MEPa(Tb) ≥ MEPa(T) for {Tb, T} = {26, 39} and {39, 52} weeks

for all tested drinking waters where criterion II was not met.

All available data should be considered, including:

- Individual test line results,

- 4-hour stagnation results, and

- Water composition parameters.

If stagnation samples have been analyzed in addition to the requirements in EN 15664-1, this data should also be considered for evaluation.

Technical Evaluation Commission will decide whether the available data is of sufficient quality for an evaluation (e.g., no significant differences between the three test lines, interpretation of outliers), and if so, they will decide based on the criteria stated above whether the material will be accepted or not. Accepted materials will be added to the Composition List along with the Category as the Reference Material.

1.8. Adding a material to the Composition List within a Material Category

When the components of a candidate material are shown to fall within a Category, the material can be added to the Composition List provided that a comparative test against the relevant Reference Material, conducted using a standardized equipment test with a standardized water as described in EN15664-2 (EN15664-1), yields satisfactory results.

The following information will be provided for each material:

- Information listed in 1.3

- Results from comparative tests conducted using EN15664-1 pipe equipment test against the Category's Reference Material

1.8.1. Acceptance of a material through a comparative test

The arithmetic average of equivalent pipe concentrations MEPn(T) will be considered for evaluating the results of the test setup (according to EN 15664-1).

All three test lines in the equipment will be taken into account for the arithmetic average MEPn(T) for all study periods (T): MEPa(T). The MEPa,RM(T) of the three reference lines will be considered for the Reference Material.

The material will be acceptable for a product group with a default contact surface a for the Reference Material (see Table 1) if:

(I) For T = 16, 21, and 26 weeks, MEPa(T) ≤ MEPa,RM(T)

(II) MEPa(Tb) ≥ MEPa(T) for {Tb, T} = {12, 16}, {16, 21}, and {21, 26} weeks for tested drinking water.

If Criterion II is not met, the test can be extended up to 1 year. In this case, the material can be acceptable if the following conditions are met:

(III) MEPa(Tb) ≥ MEPa(T) for {Tb, T} = {26, 39} and {39, 52} weeks.

All available data must be considered. For the test arrangement according to EN 15664-1, these are:

— Results of individual test lines,

— 4-hour stagnation results, and

— Water composition parameters.

If stagnant samples have been analyzed in addition to the requirements of TS EN 15664-1, this data must also be considered for the evaluation.

Technical Evaluation Commission will decide whether the available data is of sufficient quality for an evaluation (e.g., no significant difference in three test lines, interpretation of outlier values), and if so, they will decide whether the materials will be accepted based on the criteria mentioned above. The accepted materials will be added to the Composition List for the Category of the Reference Material used for the comparative test.

Annex-II

Paragraph 2 of Acceptance of Metallic Materials Used in Products in Contact with Drinking Water. Common Approach. Part B - Common Composition List' is presented in section 2[3].

The applicable product group and bases for each category are given as legends below the tables.

Copper Alloys

Copper-Zinc-Lead Alloys

1.8.1.1. Category

Composition Limits for the Category

Component	Contents (%)	Impurity	Maximum (%)
Copper	≥ 57.0	Antimony	0.02
Zinc	Arta kalan	Arsenic	0.02
Lead	≤ 3.5	Bismuth	0.02
Aluminum	≤ 1.0	Cadmium	0.02
Iron	≤ 0.5	Chromium	0.02
Silicon	≤ 1.0	Nickel	0.2
Tin	≤ 0.5		

Composition of Reference Material

Component	Contents (%)	Impurity	Maximum (%)
Copper	57.0 – 59.0	Antimony	0.02
Zinc	Remaining	Arsenic	0.02
Lead	1.9-2.1	Bismuth	0.02
		Cadmium	0.02
		Chromium	0.02
		Nickel	0.2

[3] https://www.ivrvalvole.it/media/pdf/istituzionali/4ms_common_comp_list.pdf

		Aluminum	0.2
		Iron	0.3
		Silicon	0.02
		Tin	0.03

Elements to be considered in flow water: Lead, nickel, copper, zinc

Additionally for each element: Acceptance factors compared to the reference material in question

1.8.1.2. Accepted alloys

Kabul edilen alaşım Pirinç B2 (CW617N CW612N bazlı)

Component	Content (%)	Impurity	Maximum (%)
Copper	57.0 – 59.0	Antimony	0.02
Zinc	Remaining	Arsenic	0.02
Lead	1.9-2.1	Bismuth	0.02
		Cadmium	0.02
		Chromium	0.02
		Nickel	0.1
		Aluminum	0.05
		Iron	0.3
		Silicon	0.03
		Tin	0.3

Accepted product groups: Product group B, Product group C

Base for acceptance: German Joint Normative Research Report RG_ALL PRODUCTS IN CONTACT WITH DRINKING WATER_01_074 File John Nuttall (March 2006)

Accepted alloy: Brass B1 (based on CW614N, CW603N)

Components	Content (%)	Impurity	Maximum (%)
Copper	57.0 – 62.0	Antimony	0.02
Zinc	Kalan	Arsenic	0.02
Lead	2.5 – 3.5	Bismuth	0.02
		Cadmium	0.02
		Chromium	0.02
		Nickel	0.2
		Aluminum	0.05
		Iron	0.3
		Silicon	0.03
		Tin	0.3

Accepted product groups: Product group C

Base for acceptance: German Joint Normative Research Report RG_C All Products in Contact with Drinking Water_01_074 File John Nuttall (March 2006)

Copper-zinc-lead-arsenic alloys

1.8.1.3. Category

Composition limits of the category

Component	Content (%)	Impurity	Maximum (%)
Copper	≥ 61.0	Antimony	0.02
Zinc	Kalan	Bismuth	0.02
Arsenic	≤ 0.15	Cadmium	0.02
Lead	≤ 2.2	Chromium	0.02
Aluminum	≤ 1.0	Nickel	0.2
Iron	≤ 0.5		
Silicon	≤ 1.0		

Tin	≤ 0.5		

Composition of reference material

Component	Content (%)	Impurity	Maximum (%)
Copper	61.0-63.0	Antimony	0.02
Zinc	Kalan	Bismuth	0.02
Arsenic	0.09-0.13	Cadmium	0.02
Lead	1.4-1.6	Chromium	0.02
Aluminum	0.5-0.7	Nickel	0.2
		Iron	0.12
		Silicon	0.02
		Tin	0.3

Elements to consider in stream water: Lead, nickel, arsenic, copper, zinc

Limitations on the use of metallic materials based on water composition (health-related)

Based on ongoing research (by the industry) results, alloying elements (components) and impurities will be restricted to allow the alloys to be used in any drinking water.

Accepted product groups: Product Group B, Product Group C

Basis for Proposal: John Nuttall Brief (March 2006)

Additionally for each element: Acceptance factors compared to the reference material in question Copper-tin-zinc lead alloys

1.8.1.4. Category

Categorynin bileşim sınırları

Components	Content (%)	Impurity	Maximum (%)
Copper	Remaining	Aluminum	0.01
Zinc	≤ 6.5	Antimony	0.1
Tin	≤ 13.0	Arsenic	0.03
Lead	≤ 3.0	Bismuth	0.02
Nickel	≤ 0.6	Cadmium	0.02

		Chromium	0.02
		Iron	0.3
		Silicon	0.01

Composition of reference material

Components	Content (%)	Impurity	Maximum (%)
Copper	Kalan	Aluminum	0.01
Zinc	5.9-6.2	Antimony	0.1
Tin	3.9-4.1	Arsenic	0.03
Lead	2.8-3.0	Bismuth	0.02
Nickel	0.5-0.6	Cadmium	0.02
		Chromium	0.02
		Iron	0.3
		Silicon	0.01

Elements to be considered in flow water: Lead, nickel, antimony, copper, zinc, tin

Additionally for each element: Acceptance factors compared to the reference material in question

1.8.1.5. Accepted alloys

Accepted alloys Gunmetal GM1 (based on CC+19K)

Components	Content (%)	Impurity	Maximum (%)
Copper	84.0 – 88.0	Aluminum	0.01
Zinc	4.0 – 6.0	Antimony	0.1
Tin	4.0 – 6.0	Arsenic	0.03
Lead	2.5-3.0	Bismuth	0.02
Nickel	0.1-0.6	Cadmium	0.02
		Chromium	0.02

		Iron	0.3
		Silicon	0.01

Accepted product groups: Product Group B, Product Group C

Basis of Proposal: German Joint Normative Research Report RG_C All Products in Contact with Drinking Water_01_074, File John Nuttall (March 2006)

Copper

1.8.1.6. Category

Composition limits for the category

Component	Content (%)	Impurity	Maximum (%)
Copper	≥ 99.9	Others total	≤ 0.1
Phosphorus	≤ 0.04		

Reference composition

Component	EN number
Cu-DHP	CW 024A

Factors to consider in flow water: None

No comparative testing required

1.8.1.7. Accepted Alloys

Copper (Cu-DHP)

Component	Content (%)	Impurity	Maximum (%)
Copper	≥ 99.9	Others total	≤ 0.1
Phosphorus	≤ 0.04		

Accepted product groups: Product group A, Product group B, Product group C

Limitations on the use of metallic materials based on water composition (health-related)

The formation of copper compounds on the surface of copper pipes and the resulting dissolution are greatly influenced by the minor components of the water composition. In some water compositions the rate of copper leaching may be unacceptably high. Regulations in the application areas may require the

water industry, copper pipe suppliers and plumbers to provide guidance on restrictions on the use of copper pipes in water compositions where excessive copper leaching may occur.

Further research on the compatibility of copper with specific water compositions should be carried out using harmonized procedures for investigation and assessment.

Tin Copper Pipes and Tin Copper Fittings

For tin copper pipes and tin copper fittings, copper is used as the base material according to 4.3.1. A tin layer is deposited on this base material through different processes. With the diffusion of copper ions into the tin layer, an increasing intermetallic phase composed of tin and copper (η-phase = Cu6Sn5) is formed.

1.8.1.8. Category

Composition Limits of the Category: Tin Layer

Component	Content (%)	Impurity	Maximum (%)
Tin & Copper	99.90	Antimony	0.01
		Arsenic	0.01
		Bismuth	0.01
		Cadmium	0.01
		Chromium	0.01
		Lead	0.01
		Nickel	0.01

Reference Composition

Copper tube according to TS EN 1057

Component	EN number
Cu-DHP	CW 024A

1.8.1.9. Accepted alloys

CW 024A Copper with a thickness of 1 µm Tin layer with the following composition:

Components	Content (%)	Impurity	Maximum (%)
Tin	90	Antimony	0.01
Copper	< 10	Arsenic	0.01

		Bismuth	0.01
		Cadmium	0.01
		Chromium	0.01
		Lead	0.01
		Nickel	0.01

Accepted for the following product groups: Product Group A, Product Group B, Product Group C.

The basis of the proposal:

Filtration tests

a: Equipment tests conducted on representative German drinking waters, published: A. Baukloh, S. Priggemeyer, U. Reiter, B. Winkler, Chemically inner tinned Copper Pipes, Less Copper in Corrosive Drinking Waters, Metall 10-11 (1998) 592 - 600.

b: Equipment tests according to DIN 50931 (equipment test): Technical report DVGW/TZW, 2000 Existing approvals without restriction in drinking waters

Galvanized steel

1.8.1.10. Category

The Zinc coating used in the galvanization process must comply with the following requirements.

Component	Content (%)	Impurity	Maximum (%)
Zinc		Antimony	0.01
		Arsenic	0.02
		Cadmium	0.01
		Chromium	0.02
		Lead	0.05
		Bismuth	0.01

1.8.1.11. Accepted alloys

The Zinc coating used in the galvanization process complies with the following:

Components	Content (%)	Impurity	Maximum (%)
Zinc		Antimony	0.01
		Arsenic	0.02
		Cadmium	0.01
		Chromium	0.02
		Lead	0.05
		Bismuth	0.01

See below for guidance on restrictions on the use of metallic materials based on water composition.

The following formula is proposed as a tool to define water compositions where corrosion rates for galvanized steel are deemed acceptable.

pH ≥ 7.5 or free CO2 ≤ 0.25 mmol/L AND Alkalinity ≥ 1.5 mmol/L

AND S1 < 2 (S1 defined below) AND Calcium ≥ 0.5 mmol/L

AND Conductivity at 25°C ≤ 600 µS/cm AND S2 < 1 or S2 > 3 (S2 defined below)

$$S_1 = \frac{c(Cl^-) + c(NO_3^-) + 2c(SO_4^{2-})}{c(HCO_3^-)} \; concentrations\ in\ mol/l$$

$$S_2 = \frac{c(Cl^-) + 2c(SO_4^{2-})}{c(NO_3^-)} \; concentrations\ in\ mol/l$$

Accepted for Product Group A

Accepted for Product Group B

Accepted for Product Group C

The basis for the proposal is the regulations on water composition in France (DTU 60.1/NF P 40-201) and Germany (DIN 50930-3). These limits are based on practical experience but are expressed differently. The proposal essentially covers the same water compositions as both regulations. The proposal takes into account the current results from research in Germany and joint normative research.

The recommendation also includes advice on local corrosion risk as described in EN 12502-3. This local corrosion often leads to deterioration in water quality as a result of iron corrosion products.

The recommendation is based on the results obtained with galvanized steel pipes containing lead concentrations between 1.0% and 0.6% in the zinc layer, assuming that pipes with lower lead concentrations will exhibit similar behavior. For carbon steel:

- Carbon Steel for pipes and tanks

- Carbon steel without permanent protective layers is not suitable for use in contact with drinking water.

- Carbon steel can be used for auxiliary parts (e.g., pumps, valves) and only for small surfaces in contact with drinking water.

1.8.1.12. Category

Ingredients and impurities must not exceed the maximum limits specified below

Component	Content (%)	Impurity	Maximum (%)
Iron		Antimony	0.02
Carbon	≤ 2.11	Arsenic	0.02
Chromium	≤ 1.0	Cadmium	0.02
Molybdenum	≤ 1.0	Lead	0.02
Nickel	≤ 0.5		

1.8.1.13. Accepted alloys

Ingredients and impurities must not exceed the maximum limits specified below:

Component	Content (%)	Impurity	Maximum (%)
Iron		Antimony	0.02
Carbon	≤ 2.11	Arsenic	0.02
Chromium	≤ 1.0	Cadmium	0.02
Molybdenum	≤ 1.0	Lead	0.02
Nickel	≤ 0.5		

Accepted product groups: Group C

Based on the proposal: Draft Italian Regulation

Calculation of the possible impact on cast iron for drinking water

Cast Iron for pipes and tanks

Cast Iron without permanent protective layers is not suitable for pipes and fittings that come into contact with potable water. Cast Iron for auxiliary parts

Unprotected cast iron can be used for certain applications (e.g. pumps, valves) and only for very small contact surfaces.

Their composition needs to be regulated with water.

1.8.1.14. Category

Bileşenler ve safsızlıklar aşağıda belirtilen maksimum limitleri aşmamalıdır:

Component	Content (%)	Impurity	Maximum (%)
		Antimony	0.02
Iron		Arsenic	0.02

Component	Content (%)	Impurity	Maximum (%)
Carbon		Cadmium	0.02
Chromium	≤ 1.0	Lead	0.02
Molybdenum	≤ 1.0		
Nickel	≤ 6.0		

1.8.1.15. Accepted alloys

Ingredients and impurities must not exceed the maximum limits specified below:

Component	Content (%)	Impurity	Maximum (%)
		Antimony	0,02
Iron		Arsenic	0,02
Carbon		Cadmium	0,02
Chromium	≤ 1,0	Lead	0,02
Molybdenum	≤ 1,0		
Nickel	≤ 6,0		

Accepted product groups: Group C

Based on proposal: Draft Italian regulation, French regulation

Calculation of possible impact on drinking water