ACCEPTANCE OF METALLIC MATERIALS USED FOR PRODUCTS IN CONTACT WITH DRINKING WATER

4MS Common Approach

Part A – Procedure for the acceptance

Part B – 4MS Common Composition List

Adopted by the 4MS Joint Management Committee

6th Revision:

27th May 2016

France, Germany, the Netherlands and the United Kingdom (4MS) work together in the framework of the 4MS Common Approach as laid down in the Declaration of Intent (January 2011). This common approach aims for convergence of the respective national approval schemes for materials and products in contact with drinking water.

The 4MS have adopted Part A of this document as a common basis for implementing the concept of accepting metallic materials in their national regulations. The document is subject to revisions agreed by the 4MS.

Part B of this document includes a Composition List of metallic materials accepted in all of the 4MS following the procedure described in Part A.

Further information may be obtained from any of the competent authorities of the 4MS.

Bundesministerium für Gesundheit (Deutschland)

Ministère du Travail, de l'Emploi et de la Santé (France)

Ministerie van Infrastructuur en Milieu (Nederland)

Department for Environment, Food and Rural Affairs (United Kingdom)

Part B – 4MS Common Composition List

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1 Introduction

Awaiting a European acceptance scheme the 4 MS co-operate concerning the convergence of their national acceptance schemes for products in contact with drinking water. The national implementation of the procedure for the acceptance of metallic materials described in Part A allows the compilation of a common Composition List for metallic materials that are accepted in all 4 MS.

Metallic materials on this common Composition List can be used for products in contact with drinking water. For the acceptance of products made of metallic materials the composition of the metallic materials have to be check for compliance with the listed materials. Further product specific tests (e.g. nickel release from chromium plated taps) for the acceptance are under consideration in some of the 4MS.

2 Compilation of a common Composition List

For the inclusion of a material onto the common Composition List the material has to be tested according to the procedure in Part A.

The primary responsibility for assessment of materials will remain at the national level making use of established processes and the expert resources available there. Thus a manufacturer may approach a national regulatory body (or its appointed agencies) for evaluation of a new material. There are obvious practical advantages for a manufacturer in the 4MS countries to work with his “home” assessment body, but he would not be required to do so. Applicants from outside the 4MS area would be free to use any of the national arrangements.

The national arrangements will continue to operate largely as at present, but instead of producing findings and recommendations for local decision, will create assessment information and proposals in a common form (Opinions). These draft opinions will be reviewed by the appropriate bodies within each of the other MS, who will offer their comments. The aim will be to achieve agreement on where and how a material is listed and on any restrictions or other information that should be included in the listing.

3 Structure of the Composition List **(see Part A 3.2)**

The Composition List contains different categories of metallic materials.

A Category is defined as:

> a group of materials with the same characteristics in respect of their field of application, behaviour in contact with drinking water and restrictions with regard to water composition and/or surface area.

The Composition List contains the categories’ range of compositions. A material falling within a category has to be tested individually for its acceptance on the list.

Each category has one reference material.

A Reference Material is defined as:

> a material falling within a category for which the characteristics of metal release into drinking water are known and reproducible, the composition is strictly controlled and the elements of interest will be at or near the upper limit of acceptability. Possible effects of some constituents to inhibit the metal release have to be taken into account.

Under each category commercially available metallic materials accepted for use in PDW will be listed. The materials may only be used for certain products due to the restrictions with respect to the surface area (Table 1).

Table 1: Product groups for metallic materials

Product Group	**Examples of products or parts of products**	**Assumed contact surface "a"**
A	Pipes in buildings installation Uncoated pipelines in water supply systems	100%
B	Fittings, ancillaries in buildings installations (e.g. pump bodies, valve bodies, water meter bodies used in buildings installations)	10%
C	1. Components of products of product group B (e.g. the spindle of a pump or the moving parts in water meter in building installations). The sum of the surfaces in contact with drinking water of all these components has to be less than 10% of the total wetted surface of the product. 2. Fittings, ancillaries in water mains and water treatment works with permanent flow (e.g. pumps bodies, valves bodies used in water supply systems)	1%
D	Components of fittings and ancillaries in water mains in water treatment works (C2)	

4MS Composition List of accepted metallic materials

I Copper alloys

1 Copper-zinc alloys

1.1 Category

Constituents (% (m/m)):

Cu	Zn
≥ 57.0%	Remainder

Impurities (% (m/m)):

Al	Fe	Ni	Pb	Sn
≤ 0.1%	≤ 0.5%	≤ 0.2%	≤ 0.2%	≤ 0.5%

Each other impurity < 0.02%

1.2 Reference Material

Constituents (% (m/m)):

Cu	Zn
57.0% - 59.0%	Remainder

Impurities (% (m/m)):

Al	Fe	Ni	Pb	Sn
≤ 0.05%	≤ 0.3%	0.15% - 0.25%	0.15% - 0.25%	≤ 0.3%

Each other impurity < 0.02%

Elements for consideration in the migration water:
Cu, Ni, Pb, Zn

Most critical test water:
Test water 1 according to EN 15664-2

1.3 Accepted Alloys

1.3.1

Notation	Product groups
CW509L* (CuZn40)	B and C

* Contents of certain elements are further restricted (see below)

Constituents (% (m/m)):

Cu	Zn
59.5% - 61.5%	Remainder

Impurities (% (m/m)):

Al	Fe	Ni*	Pb*	Sn
≤ 0.05%	≤ 0.2%	≤ 0.2%	≤ 0.2%	≤ 0.2%

Each other impurity < 0.02%

Basis for acceptance
UBA opinion (23 Nov 2011)
UBA opinion (25 March 2013)

1.3.2

Notation	Product Group
CW510L* (CuZn42)	B and C

* Contents of certain elements are further restricted (see below)

Constituents (% (m/m)):

Cu	Zn
57.0% - 59.0%	Remainder

Impurities (% (m/m)):

Al	Fe	Ni*	Pb	Sn
≤ 0.05%	≤ 0.3%	≤ 0.2%	≤ 0.2%	≤ 0.3%

Each other impurity < 0.02%

Basis for acceptance
UBA opinion (23 Nov 2011)
UBA opinion (25 March 2013)

2 Copper-zinc-aluminum alloys

2.1 Category

Constituents (% (m/m)):

Cu	Zn	Al
≥ 57.0%	Rem.	0.1% - 0.3%

Impurities (% (m/m)):

Fe	Pb	Sn
≤ 0.3%	≤ 0.2%	≤ 0.3%

2.2 Reference Material

Constituents (% (m/m)):

Cu	Zn	Al
57.0% - 59.0%	Rem.	0.1% - 0.2%

Impurities (% (m/m)):

Fe	Pb	Sn
≤ 0.3%	0.15% - 0.25%	≤ 0.3%

Each other impurity < 0.02%

Elements for consideration in the migration water:
Al, Cu, Pb, Zn

Most critical test water:
Test water 1 according to EN 15664-2

2.3 Accepted Alloys

2.3.1

Notation	Product groups
CuZn42Al	B und C

Constituents (% (m/m))

Cu	Zn	Al
57.0% - 59.0%	Rem.	0.1% - 0.3%

Impurities (% (m/m))

Fe	Pb	Sn
≤ 0.3%	≤ 0.2%	≤ 0.3%

Each other impurity < 0.02%

Basis for acceptance
UBA opinion (16 March 2015)

3 Copper-zinc-arsenic alloys

3.1 Category

Constituents (% (m/m)):

Cu	Zn	As
≥ 61.0%	Reminder	0.02% - 0.15%

Impurities (% (m/m)):

Al	Fe	Mn	Ni	Pb	Sn
≤ 0.1%	≤ 0.5%	≤ 0.1%	≤ 0.3%	≤ 0.2%	≤ 0.5%

Each other impurity < 0.02%

3.2 Reference Material

Constituents (% (m/m)):

Cu	Zn	As
61.5% - 63.5%	Remainder	0.10% - 0.15 %

Impurities (% (m/m)):

Al	Fe	Mn	Ni	Pb	Sn
≤ 0.1%	≤ 0.1%	≤ 0.1%	0.21% - 0.35%	0.15% - 0.25%	≤ 0.1%

Each other impurity < 0.02%

Elements for consideration in the migration water:
As, Cu, Ni, Pb, Zn

Most critical test water:
Test water 1 according to EN 15664-2

3.3 Accepted Alloys

3.3.1

Notation	Product groups
CW511L (CuZn38As)	B and C

* Contents of certain elements are further restricted (see below)

Constituents (% (m/m)):

Cu	Zn	As
61.5% - 63.5%	Remainder	0.02% - 0.15%

Impurities (% (m/m)):

Al	Fe	Mn	Ni	Pb	Sn
≤ 0.05%	≤ 0.1%	≤ 0.1%	≤ 0.3%	≤ 0.2%	≤ 0.1%

Each other impurity < 0.02%

Basis for acceptance
UBA opinion (28 March 2013)

4 Copper-zinc-arsenic-aluminium alloys

4.1 Category

Constituents (% (m/m)):

Cu	Zn	As	Al
≥ 61.0%	Remainder	0.02% - 0.15%	0.2% - 1.0%

Impurities (% (m/m)):

Fe	Mn	Pb	Sn
≤ 0.5%	≤ 0.1%	≤ 0.2%	≤ 0.3%

Each other impurity < 0.02%

4.2 Reference Material

Constituents (% (m/m)):

Cu	Zn	As	Al
63.0% - 64.5%	Remainder	0.11% - 0.14%	0.2% - 0,4%

Impurities (% (m/m)):

Fe	Mn	Pb	Sn
≤ 0.3%	≤ 0.1%	0.15% - 0.25%	≤ 0.3%

Each other impurity < 0.02%

Elements for consideration in the migration water:
Al, As, Cu, Pb, Zn

Most critical test water:
Test water 1 according to EN 15664-2

4.3 Accepted Alloys

4.3.1

Notation	Product groups
CuZn35Al-C	B and C

Constituents (% (m/m)):

Cu	Zn	As	Al
63.0% - 64.5%	Remainder	0.04% - 0.14%	0.2% - 0.7%

Impurities (% (m/m)):

Fe	Mn	Pb	Sn
≤ 0.3%	≤ 0.1%	≤ 0.2%	≤ 0.3%

Each other impurity < 0.02%

Basis for acceptance
UBA-opinion (29 July 2014)

5. Copper-zinc-arsenic-antimony-aluminum alloys

5.1 Category

Constituents (% (m/m)):

Cu	Zn	As	Sb	Al
≥ 60.0%	Rem.	0.02% - 0.10%	0.02% - 0.10%	0.02% - 1.0%

Impurities (% (m/m)):

Fe	Mn	Ni	Pb	Sn
≤ 0.5%	≤ 0.1%	≤ 0.2%	≤ 0.2%	≤ 0.5%

5.2 Reference Material

Constituents (% (m/m)):

Cu	Zn	As	Sb	Al
62.0% - 65.0%	Rem.	0.03% - 0.04%	0.04% - 0.05%	0.45% - 0.58%

Impurities (% (m/m)):

Fe	Mn	Ni	Pb	Sn
≤ 0.2%	≤ 0.1%	0.12% - 0.20%	0.15% - 0.25%	≤ 0.3%

Each other impurity < 0.02%

Elements for consideration in the migration water:
Al, As, Cu, Ni, Pb, Sb, Zn

Most critical test water:
Test water 1 according to EN 15664-2

5.*3 Accepted Alloys*

5.3.1

Notation	Product groups
CC771S (CuZn38AsSb)	B and C

Constituents (% (m/m))

Cu	Zn	As	Sb	Al
62.0% - 65.0%	Rem.	0.02% - 0.04%	0.02% - 0.05%	0.45% - 0,7%

Impurities (% (m/m))

Fe	Mn	Ni	Pb	Sn
≤ 0.2%	≤ 0.1%	≤ 0.20%	≤ 0.2%	≤ 0.3%

Each other impurity < 0.02%

Basis for acceptance
UBA opinion (10 July 2015)

6 Copper-zinc-lead alloys

6.1 Category

Constituents (% (m/m)):

Cu	Zn	Pb
≥ 57.0%	Remainder	0.2% - 3.5%

Impurities (% (m/m)):

Al	Fe	Ni	Si	Sn
≤ 0.3%	≤ 0.5%	≤ 0.2%	≤ 0.2%	≤ 0.5%

Each other impurity < 0.02%

6.2 Reference Material

Constituents (% (m/m)):

Cu	Zn	Pb
57.0% - 59.0%	Remainder	1.9% - 2.2%

Impurities (% (m/m)):

Al	Fe	Ni	Si	Sn
≤ 0.2%	≤ 0.3%	0.05% - 0.15%	≤ 0.03%	≤ 0.3%

Each other impurity < 0.02%

Elements for consideration in the migration water:
Cu, Ni, Pb, Zn

Most critical test water:
Test water 1 according to EN 15664-2

6.3 Accepted Alloys

6.3.1

Notation	Product groups
CW617N* (CuZn40Pb2) **CW612N* (CuZn39Pb2)**	B and C

* Contents of certain elements are further restricted (see below)

Constituents (% (m/m)):

Cu	Zn	Pb*
57.0% - 60.0%	Remainder	1.6% - 2.2%

Impurities (% (m/m)):

Al	Fe	Ni*	Si	Sn
≤ 0.05%	≤ 0.3%	≤ 0.1%	≤ 0.03%	≤ 0.3%

Each other impurity < 0.02%

Basis for acceptance
German Co-normative Research Report RG_CPDW_01_074
Dossier John Nuttall (March 2006)

6.3.2

Notation	Product groups
CW614N* (CuZn39Pb3) **CW603N* (CuZn36Pb3)**	C

* Contents of certain elements are further restricted (see below)

Constituents (% (m/m)):

Cu	Zn	Pb
57.0% - 62.0%	Remainder	2.5% - 3.5%

Impurities (% (m/m)):

Al	Fe	Ni	Si	Sn
≤ 0.05%	≤ 0.3%	≤ 0.2%	≤ 0.03%	≤ 0.3%

Each other impurity < 0,02%

Basis for acceptance
German Co-normative Research Report RG_CPDW_01_074
Dossier John Nuttall (March 2006)

7 Copper-zinc-lead-aluminium alloys

7.1 Category

Constituents (% (m/m)):

Cu	Zn	Pb	Al
≥ 57.0%	Remainder	0.2% - 1.5%	0.2% - 1.0%

Impurities (% (m/m)):

Fe	Mn	Ni	Si	Sn
≤ 0.5%	≤ 0.05%	≤ 0.2%	≤ 0.05%	≤ 0.5%

Each other impurity < 0.02%

7.2 Reference Material

Constituents (% (m/m)):

Cu	Zn	Pb	Al
58.0% - 63.0%	Remainder	1.2% - 1.4%	0.3% - 0.6%

Impurities (% (m/m)):

Fe	Mn	Ni	Si	Sn
≤ 0.3%	≤ 0.05%	0.15% - 0.25%	≤ 0.05%	≤ 0.5%

Each other impurity < 0.02%

Elements for consideration in the migration water:
Al, Cu, Ni, Pb, Zn

Most critical test waters:
Test water 1 and 2 according to EN 15664-2

7.3 Accepted Alloys

7.3.1

Notation	Product groups
CC757S* (CuZn39Pb1Al-C)	B and C

* Contents of certain elements are further restricted (see below)

Constituents (% (m/m)):

Cu	Zn	Pb*	Al
58.0% - 63.0%	Remainder	0.2% - 1.4%	0.3% - 0.9%

Impurities (% (m/m)):

Fe	Mn	Ni	Si	Sn
≤ 0.3%	≤ 0.05%	≤ 0.2%	≤ 0.05%	≤ 0.5%

Each other impurity < 0.02%

Basis for acceptance
UBA opinion (29 Aug 2014)

8 Copper-zinc-lead-arsenic-aluminium alloys

8.1 Category

Constituents (% (m/m)):

Cu	Zn	Pb	As	Al
≥ 61.0%	Remainder	0.2% - 2.2%	0.02% - 0.15%	0.02% - 1.0%

Impurities (% (m/m)):

Fe	Mn	Ni	Sn
≤ 0.5%	≤ 0.1%	≤ 0.2%	≤ 0.5%

Each other impurity < 0.02%

8.2 Reference Material

Constituents (% (m/m)):

Cu	Zn	Pb	As	Al
61.0% - 63.0%	Remainder	1.4% - 1.6%	0.09% - 0.13%	0.5% - 0.7%

Impurities (% (m/m)):

Fe	Mn	Ni	Sn
≤ 0.3%	≤ 0.1%	0.15% - 0.25%	≤ 0.3%

Each other impurity < 0.02%

Elements for consideration in the migration water:
Al, As, Cu, Ni, Pb, Zn

Most critical test water:
Test water 1 according to EN 15664-2

8.3 Accepted Alloys

8.3.1

Notation	Product groups
CC770S (CuZn36Pb-C)	B and C

Constituents (% (m/m)):

Cu	Zn	Pb	As	Al
62.0% - 64.0%	Remainder	0.2% - 1.6%	0.04% - 0.14%	0.5% - 0.7%

Impurities (% (m/m)):

Fe	Mn	Ni	Sn
≤ 0.3%	≤ 0.1%	≤ 0.2%	≤ 0.3%

Each other impurity < 0.02%

Basis for acceptance
UBA opinion (29 Jan 2014)

8.3.2

Notation	Product groups
CW626N (CuZn33Pb1.5AlAs))	B and C

Constituents (% (m/m)):

Cu	Zn	Pb	As	Al
64.0% - 66.0%	Remainder	1.2% - 1.7%	0.02% - 0.15%	0.8% - 1.0%

Impurities (% (m/m)):

Fe	Mn	Ni	Sn
≤ 0.3%	≤ 0.1%	≤ 0.2%	≤ 0.3%

Each other impurity < 0.02%

Basis for acceptance
UBA opinion (02 April 2013)

8.3.3

Notation	Product groups
CW625N (CuZn35Pb1.5AlAs)	B and C

Constituents (% (m/m)):

Cu	Zn	Pb	As	Al
62.0% - 64.0%	Remainder	1.2% - 1.6%	0.02% - 0.15%	0.5% - 0.7%

Impurities (% (m/m)):

Fe	Mn	Ni	Sn
≤ 0.3%	≤ 0.1%	≤ 0.2%	≤ 0.3%

Each other impurity < 0.02%

Basis for acceptance
UBA opinion (29 Jan 2014)

9 Copper-zinc-lead-arsenic-antimony-aluminum alloys

9.1 Category

Constituents (% (m/m)):

Cu	Zn	Pb	As	Sb	Al
≥ 60.0%	Rem.	0.2% - 1.1 %	0.02% - 0.10%	0.02% - 0.10%	0.02% - 1.0%

Impurities (% (m/m)):

Fe	Mn	Ni	Sn
≤ 0.5%	≤ 0.1%	≤ 0.2%	≤ 0.5%

9.2 Reference Material

Constituents (% (m/m)):

Cu	Zn	Pb	As	Sb	Al
62.0% - 65.0%	Rem.	0.9% - 1.1%	0.03% - 0.04%	0.05% - 0.06%	0.45% - 0.58%

Impurities (% (m/m)):

Fe	Mn	Ni	Sn
≤ 0.2%	≤ 0.1%	0.15% - 0.25%	≤ 0.3%

Each other impurity < 0.02%

Elements for consideration in the migration water:
Al, As, Cu, Ni, Pb, Sb, Zn

Most critical test water:
Test water 1 according to EN 15664-2

9.3 Accepted Alloys

9.3.1

Notation	Product groups
CC772S (CuZn36Pb1.5AsSbAl)	B and C

Constituents (% (m/m))

Cu	Zn	Pb	As	Sb	Al
62.0% - 65.0%	Rem.	0.2% - 1.1%	0.02% - 0.04%	0.03% - 0.06%	0.45% - 0,7%

Impurities (% (m/m))

Fe	Mn	Ni	Sn
≤ 0.2%	≤ 0.1%	≤ 0.2%	≤ 0.3%

Each other impurity < 0.02%

Basis for acceptance
UBA opinion (29 Aug 2014)

10 Copper-zinc-lead-arsenic-aluminium-silicon alloys

10.1 Category

Constituents (% (m/m)):

Cu	Zn	Pb	As	Al	Si
≥ 61.0%	Remainder	0.2% - 1.0%	0.02% - 0.10%	0.02% - 1.0%	0.02% - 0.5%

Impurities (% (m/m)):

Fe	Mn	Ni	Sn
≤ 0.5%	≤ 0.1%	≤ 0.2%	≤ 0.5%

Each other impurity < 0.02%

10.2 Reference Material

Constituents (% (m/m)):

Cu	Zn	Pb	As	Al	Si
64.0% - 67.0%	Remainder	0.60% - 0.65%	0.07% - 0.08%	0.1% - 0.25%	0.1% - 0.2%

Impurities (% (m/m)):

Fe	Mn	Ni	Sn
≤ 0.3%	≤ 0.1%	0.15% - 0.25%	≤ 0.3%

Each other impurity < 0.02%

Elements for consideration in the migration water:
Al, As, Cu, Ni, Pb, Zn

Most critical test water:
Test water 1 and 2 according to EN 15664-2

10.3 Accepted Alloys

10.3.1

Notation	Product groups
CW725R*(CuZn33Pb1AlSiAs)	B and C

* Contents of certain elements are further restricted (see below)

Constituents (% (m/m)):

Cu	Zn	Pb*	As	Al	Si
64.0% - 67.0%	Remainder	0.4% - 0.6%	0.04% - 0.08%	0.1% - 0.4%	0.1% - 0.3%

Impurities (% (m/m)):

Fe	Mn	Ni	Sn
≤ 0.3%	≤ 0.1%	≤ 0.2%	≤ 0.3%

Each other impurity < 0.02%

Basis for acceptance
UBA opinion (27 July 2014)

11 Copper-tin-zinc-lead-nickel alloys

11.1 Category

Constituents (% (m/m)):

Cu	Sn	Zn	Pb	Ni
Remainder	4.0% - 13.0%	4.0% - 6.5%	0.2% - 3.0%	0.1% - 0.6%

Impurities (% (m/m)):

Fe	P	S	Sb
≤ 0.30%	≤ 0.04%	≤ 0.04%	≤ 0.10%

Each other impurity < 0.02%

11.2 Reference Material

Constituents (% (m/m)):

Cu	Sn	Zn	Pb	Ni
Remainder	4.0% - 4.2%	5.7% - 6.0%	2.8% - 3.0%	0.5% - 0.6%

Impurities (% (m/m)):

Fe	P	S	Sb
≤ 0.30%	≤ 0.04%	≤ 0.04%	0.09% - 0,15%

Each other impurity < 0.02%

Elements for consideration in the migration water:
Cu, Ni, Pb, Sb, Zn

Most critical test water:
Test water 1 according to EN 15664-2

11.3 Accepted Alloys

11.3.1

Notation	Product groups
CC499K* (CuSn5Zn5Pb2-C)	B and C

* Contents of certain elements are further restricted (see below)

Constituents (% (m/m)):

Cu	Sn	Zn	Pb*	Ni*
84.0% - 88.0%	4.0% - 6.0%	4.0% - 6.0%	0.2% - 3.0%	0.1% - 0.60%

Impurities (% (m/m)):

Fe	P	S	Sb
≤ 0.30%	≤ 0.04%	≤ 0.04%	≤ 0.10%

Each other impurity < 0.02%

Basis for acceptance
German Co-normative Research Report RG_CPDW_01_074
Dossier John Nuttall (March 2006)

12 Copper-zinc-silicon-phosphorous alloys

12.1 Category

Constituents (% (m/m)):

Cu	Zn	Si	P
60.0% - 80.0%	Remainder	0.5% - 5.5%	0.01% - 0.3%

Impurities (% (m/m)):

Al	Fe	Mn	Ni	Pb	Sn
≤ 0.1%	≤ 0.5%	≤ 0.05%	≤ 0.2%	≤ 0.1%	≤ 0.5%

Each other impurity < 0.02%

12.2 Reference Material

Constituents (% (m/m)):

Cu	Zn	Si	P
75.0% - 77.0%	Remainder	2.7% - 3.0%	0.02% - 0.06%

Impurities (% (m/m)):

Al	Fe	Mn	Ni	Pb	Sn
≤ 0.05%	≤ 0.3%	≤ 0.05%	0.15% - 0.25%	0.09% - 0.15%	≤ 0.3%

Each other impurity < 0.02%

Elements for consideration in the migration water:
Cu, Ni, Pb, Zn

Most critical test water:
Test water 1 according to EN 15664-2

12.3 Accepted Alloys

12.3.1

Notation	Product groups
CW724R (CuZn21Si3P)	B and C

Constituents (% (m/m)):

Cu	Zn	Si	P
75.0% - 77.0%	Remainder	2.7% - 3.5%	0.02% - 0.10%

Impurities (% (m/m)):

Al	Fe	Mn	Ni	Pb	Sn
≤ 0.05%	≤ 0.3%	≤ 0.05%	≤ 0.2%	≤ 0.1%	≤ 0.3%

Each other impurity < 0.02%

Basis for acceptance
UBA opinion (24 Feb 2012)

12.3.2

Notation	Product groups
CC768S (CuZn21Si3P)	B and C

Constituents (% (m/m)):

Cu	Zn	Si	P
75.0% - 77.0%	Remainder	2.7% - 3.5%	0.02% - 0.10%

Impurities (% (m/m)):

Al	Fe	Mn	Ni	Pb	Sn
≤ 0.05%	≤ 0.3%	≤ 0.05%	≤ 0.2%	≤ 0.1%	≤ 0.3%

Each other impurity < 0.02%

The content of boron and zirconium has to be less than 0.02%.

Basis for acceptance
UBA opinion (09 Jan 2014)

13 Copper-zinc-silicon-phosphorous-manganese alloys

13.1 Category

Constituents (% (m/m)):

Cu	Zn	Si	P	Mn
≥ 80.0%	Remainder	0.5% - 5.5%	0.01% - 0.3%	0.01 – 0.2%

Impurities (% (m/m)):

Al	Fe	Ni	Pb	Sn
≤ 0.3%	≤ 0.5%	≤ 0.1%	≤ 0.1%	≤ 0.5%

Each other impurity < 0.02%

13.2 Reference Material

Constituents (% (m/m)):

Cu	Zn	Si	P	Mn
Remainder	8.0% - 10.0%	2.5% - 3.5%	0.05% - 0.10%	0.03% - 0.09%

Impurities (% (m/m)):

Al	Fe	Ni	Pb	Sn
≤ 0.3%	≤ 0.3%	0.06% - 0.10%	0.06% - 0.10%	≤ 0.3%

Each other impurity < 0.02%

Elements for consideration in the migration water:
Cu, Mn, Ni, Pb, Zn

Most critical test water:
Test water 1 according to EN 15664-2

13.3 Accepted Alloys

13.3.1

Notation	Product groups
CuZn10Si4MnP	B and C

Constituents (% (m/m)):

Cu	Zn	Si	P	Mn
84.0% - 96.0%	≤ 11.0%	2.5% - 4.5%	0.05% - 0.15%	0.03% - 0.09%

Impurities (% (m/m)):

Al	Fe	Ni	Pb	Sn
≤ 0.3%	≤ 0.3%	≤ 0.10%	≤ 0.10%	≤ 0.3%

Each other impurity < 0.02%

Basis for acceptance
UBA opinion (06 Feb 2013)

II Coppers

1 Copper

1.1 Category

Constituents (% (m/m)):

Cu	P
≥ 99.9%	≤ 0.04%

Impurities (% (m/m)):

Others total
≤ 0.1%

Each impurity < 0.02%

1.2 Reference Material

CW024A (CU-DHP)

Elements for consideration in the migration water:
None: No need for comparative testing

1.3 Accepted Alloys

Notation	Product groups
CW024A (Cu-DHP)	A, B and C

Constituents (% (m/m)):

Cu	P
≥ 99.9%	0.015% - 0.04%

Restrictions for the use of metallic materials with respect to water composition (health based)
The formation of the copper compounds on the surface of copper pipes and consequently the dissolution is strongly influenced by minor components of the water composition. In some water compositions, the rate of leaching of copper may be unacceptably high. Member States may need to offer guidance to the water industry and to suppliers and installers of copper pipe on restrictions that may need to be introduced on use of copper pipe in water compositions where excessive leaching of copper might occur.
Further research into the compatibility of copper with certain compositions of water needs to be carried out using harmonised procedures for investigation and evaluation.

Basis for acceptance
Research results and practical experience in several Member States are needed to characterise the conditions for safe use.

Note
The contamination of drinking water by copper pipes depends on several characteristics of water composition. There is no consensus view on their combined action and interaction at this time. In particular, there is inadequate information on the range of compositions of drinking water where non-compliance with the DWD is likely to occur.

2 Tinned copper pipes and tinned copper fittings

For tinned copper tubes and tinned copper fittings as base material copper according to 1 is used. On this substrate material a tin layer is deposited by different processes. By diffusion of copper ions into the tin layer the formation of an increasing intermetallic phase consisting of tin and copper (η-phase = Cu_6Sn_5) is formed.

2.1 Category

Constituents of the tin layer (% (m/m)):

Sn + Cu
≥ 99.90%

Impurities of the tin layer (% (m/m)):

As	Bi	Cd	Cr	Ni	Pb	Sb
≤ 0.01%	≤ 0.01%	≤ 0.01%	≤ 0.01%	≤ 0.01%	≤ 0.01%	≤ 0.01%

2.2 Reference Material

CW024A (CU-DHP)

2.3 Accepted Alloys

Notation	Product groups
CW024A (Cu-DHP) with a tin layer thickness of 1 µm	A, B and C

Constituents of the tin layer (% (m/m)):

Sn	Cu
> 90%	< 10%

Impurities of the tin layer (% (m/m)):

As	Bi	Cd	Cr	Ni	Pb	Sb
≤ 0.01%	≤ 0.01%	≤ 0.01%	≤ 0.01%	≤ 0.01%	≤ 0.01%	≤ 0.01%

Basis for acceptance

1. Leaching tests:
   a. Rig tests in 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. Rig tests according to DIN 50931 (rig test): Technical report DVGW/TZW, 2000
2. Already existing approvals without restrictions in drinking waters
   a. Netherlands: according to BRL-K19005,
   b. Germany: according to DIN 50930, T6 and DVGW GW 392
   c. Denmark, ETA

III Steel / Iron

1 Galvanised steel

1.1 Category

Constituents of the zinc coating (% (m/m)):

Zn

Impurities of the zinc coating (% (m/m)):

As	Bi	Cd	Cr	Pb	Sb
≤ 0.02%	≤ 0.01%	≤ 0.01%	≤ 0.02%	≤ 0.05%	≤ 0.01%

1.2 Reference Material

Not required

1.3 Accepted Alloys

Notation	Product groups
Galvanised steel	A, B and C

Constituents of the zinc coating (% (m/m)):

Zn

Impurities of the zinc coating (% (m/m)):

As	Bi	Cd	Cr	Pb	Sb
≤ 0.02%	≤ 0.01%	≤ 0.01%	≤ 0.02%	≤ 0.05%	≤ 0.01%

Guidance on restrictions for the use of metallic materials with respect to water composition

The following formula is proposed as a means identifying water compositions where corrosion rates for galvanised steel is acceptable.

	pH ≥ 7.5 or free CO_2 ≤ 0.25 mmol/L
AND	Alkalinity ≥ 1.5 mmol/L
AND	S_1 < 2 (*definition of S_1 below*)
AND	Calcium ≥ 0.5 mmol/L
AND	Conductivity ≤ 600 µS/cm at 25°C
AND	S_2 <1 or S_2>3 (*definition of S_2 below*)

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

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

Basis for acceptance
There are regulations with respect to water composition in France (DTU 60.1 / NF P 40-201) and in Germany (DIN 50930-3). These limits are based on practical experience but are expressed in different ways. The proposal covers mainly the same water compositions as both regulations. The proposal takes into account available results from research in Germany and co-normative research.
The proposal incorporates also the recommendations given EN 12502-3 with regard to the risk of localised corrosion. This localised corrosion frequently leads to deterioration in water quality as a result of corrosion products of iron.

The proposal is based on results that have been obtained with galvanised steel pipes with lead concentrations between 1.0% and 0.6% in the zinc layer, assuming a similar behaviour of pipes with lower lead concentrations.

2 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 for ancillaries

Unprotected carbon steel can be used for specific applications (e.g. pumps, valves) and only for small surface in contact with water.

2.1 Category

Constituents (% (m/m)):

Fe	C	Cr	Mo	Ni
	≤ 2.11%	≤ 1.0%	≤ 1.0%	≤ 0.5%

Impurities (% (m/m)):

As	Cd	Pb	Sb
≤ 0.02%	≤ 0.02%	≤ 0.02%	≤ 0.02%

2.2 Reference Material

Not required

2.3 Accepted Alloys

Notation	Product groups
Carbon Steel	C

Constituents (% (m/m)):

Fe	C	Cr	Mo	Ni
	≤ 2.11%	≤ 1.0%	≤ 1.0%	≤ 0.5%

Impurities (% (m/m)):

As	Cd	Pb	Sb
≤ 0.02%	≤ 0.02%	≤ 0.02%	≤ 0.02%

Basis for acceptance
Draft Italian Regulation
Calculation of possible impact on DW

3 Cast iron

Cast iron for pipes and tanks

Cast iron without permanent protective layers is not suitable for pipes and fittings in contact with drinking water.

Cast iron for ancillaries

Unprotected cast iron can be used for specific applications (e.g. pumps, valves) and only for very small surface in contact with water. Their composition needs to be regulated.

3.1 Category

Constituents (% (m/m)):

Fe	C	Cr	Mo	Ni
		≤ 1.0%	≤ 1.0%	≤ 6.0%

Impurities (% (m/m)):

As	Cd	Pb	Sb
≤ 0.02%	≤ 0.02%	≤ 0.02%	≤ 0.02%

2.2 Reference Material

Not required

2.3 Accepted Alloys

Notation	Product groups
Cast Iron	C

Constituents (% (m/m)):

Fe	C	Cr	Mo	Ni
		≤ 1.0%	≤ 1.0%	≤ 6.0%

Impurities (% (m/m)):

As	Cd	Pb	Sb
≤ 0.02%	≤ 0.02%	≤ 0.02%	≤ 0.02%

Basis for acceptance
Draft Italian Regulation
French regulation
Calculation of possible impact on DW

4 Stainless steel

Stainless steels according to EN 10088 and EN 10283 can be applied for all product groups (pipes (A), pipe connectors and pumps (B) and components in fittings and pumps (C)).

Restrictions:

Some stainless steels show a higher probability of occurrence of local corrosion (e.g. pitting or crevice corrosion) caused by the contact with certain drinking waters or in case of disinfection with high chlorine concentrations. For this purpose EN 16056 can be used to compare the passivity behaviour of the different stainless steel grades.

IV Platings

1 Tin plating applied by a galvanic process on the external surface

Components made of CW617N and CW612N (corresponding 4MS Composition List: I Copper alloys / 6.3.1) can be plated galvanically with a layer composition of copper and tin.

Restrictions:

- Bulk material CW617N and CW612N (corresponding 4MS Composition List: I Copper alloys / 6.3.1)
- Layer composition: 1.) Cu 2.) Sn
- applied process: galvanic tin plating
- Purity of the used anodes: ≥ 99,90 %

Additional requirement:

For the respective production process it has to be proven that the manufactured products are not contaminated with organic substances used in the galvanic process baths. This can be demonstrated by a migration test according to EN 12873-1. The evidence can be provided in the course of an approval/certification process of respective plated products. In this process a test of the metal release is not required. Additionally, a quality assurance scheme for the production process is required. In UK additional product tests might be necessary.

V Passive materials and copper alloys for product group D

In addition to the materials listed for the Product Groups A, B and C for components of the Product Group D further passive metallic materials and copper alloys can be used.

The copper alloys have to comply with:

- Cu, Zn, Si, Sn, P: no restrictions
- Pb: max. 3.5% (m/m)
- Ni: max. 3.0% (m/m)
- As, Sb: max: 0.25% (m/m)
- All other: max. 0.1% (m/m)