Comments to the ECHA consultation on the 6th priority list of substances for inclusion in Annex XIV – inclusion in Annex XIV REACH and socio-economic impacts of such an inclusion –

1 Substances

The following comments refer to the substances:

Substance name:	**Disodium tetraborate, anhydrous**
Chemical formula:	$Na_2B_4O_7$
CAS Number:	1330-43-4
EC Number:	215-540-4

Substance name:	**Diboron trioxide**
Chemical formula:	B_2O_3
CAS Number:	1303-86-2
EC Number:	215-125-8

2 Personal information

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3 Company

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The Wieland-Werke AG produces semi-finished products and final products made from copper and copper alloys.

Sector: Production of base metals – copper production (NACE II: 24.44)

4 Comments on ECHA´s draft recommendation to include the substances in Annex XIV

The Wieland-Werke AG is a downstream user of disodium tetraborate and diboron trioxide. Our company uses casting salts composed of disodium tetraborate and diboron trioxide as processing aid within metallurgical processes for copper alloys. The content of disodium

tetraborate and diboron trioxide in the casting salt is above the specific concentration limit. The casting salt is not incorporated in the product.

4.1 Uses in our company:

Our company uses a mixture of mainly disodium tetraborate and diboron trioxide, together with smaller quantities of other oxides, as casting salt for casting copper alloys, in particular brasses, bronzes and technologically sophisticated high performance copper alloys.

The specific uses of disodium tetraborate and diboron trioxide in our company can be described as follows:

1. **Formulation of a mixture from disodium tetraborate and diboron trioxide (→ casting salt)**

   Process steps:
   mixing of disodium tetraborate and diboron trioxide → melting of a glass → solidification → crunching of the glass

   Use Descriptor System:

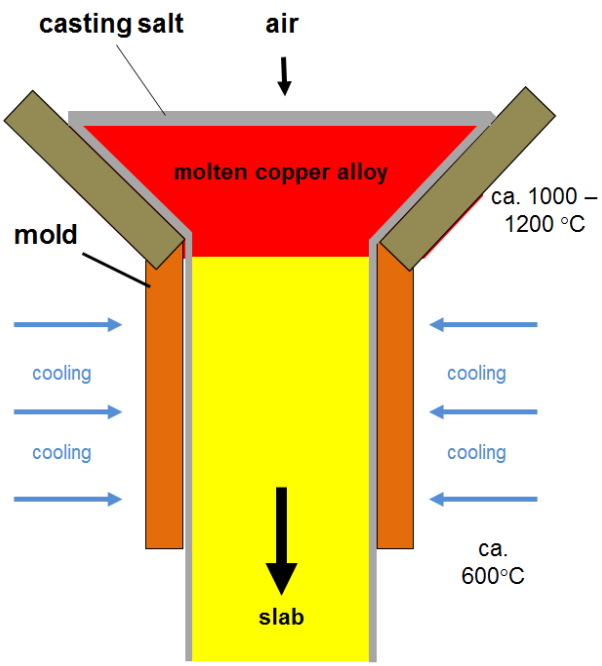
   SU: 3,10,13; PC: 38; PROC: 4, 5, 8b, 9, 14 [1]

2. **Use of the casting salt in the casting process of copper alloys**

   A casting salt is a coarse solid which is applied directly on the surface of the molten copper alloy. The solid melts and forms a highly viscous liquid, similar to that of a molten glass. The typical temperature range, in which a casting salt is used in the process of copper alloys, is 600-1200 °C.

   The functions of a casting salt are:

   - coverage of the molten copper alloy to prevent oxidation of alloy constituents
   - lubrication between slab and (permanent) casting mold
   - binding and removal of slags formed during the casting process



   Casting salts based on disodium tetraborate and diboron trioxide have optimum properties with respect to transition temperature, viscosity of the resulting glassy melt,

1 According to: Guidance on information requirements and chemical safety assessment, Chapter R.12: Use descriptor system, Version 2, March 2010

tribology, thermal properties and chemical behavior for an application in the casting process of copper alloys.

Small variations in the composition of the casting salt adopts it's properties to the requirements of the respective copper alloy and the corresponding process.

Use Descriptor System:

SU: 3,14 PC: 7; PROC: 22; AC: 7 [1]

4.2 Risks from the formulation and the use of casting salts

Casting salts are exclusively formulated and used at industrial sites by trained workers, without being incorporated in the casted copper alloy.

4.2.1 Risk for workers

The national occupational emission limit value (OEL) for borates and boron oxide in Germany is 0,5 mg/m^3 (as B) [2].

DNEL ($Na_2B_4O_7$): 6,74 mg/m^3 (inhalation, chronic, systemic) and 11,72 mg/m^3 (inhalation, acute)

DNEL (B_2O_3): 4,66 mg/m^3 (inhalation, chronic, systemic)

The German OEL is well below the DNELs.

The risk at the workplace for the formulation of the mixture of disodium tetraborate and diboron trioxide as well as for the use of disodium tetraborate and diboron trioxide as a casting salt are assessed according to German safety and workplace regulations.

Stationary protective equipment is installed at the mixing unit as well as at the casting device.

The risk analyses concluded that no additional Personal Protective Equipment (PPE) is required when formulating and using casting salts. Only for the commissioning within the formulation process, a dust mask (P2) is used with respect to the general dust emission.

4.2.2 Risk for consumers:

No risk for consumers. Casting salts are not incorporated in the product.

4.3 Conclusion on risk management options

The use of disodium tetraborate and diboron trioxide as a casting salt as described above is already adequately controlled by existing safety and workplace regulations.

Authorization is not the right instrument to regulate the risk of using the substances disodium tetraborate and diboron trioxide as their use is purely an industrial use.

2 TGRS 900 (2012-01-12)

In many European countries OELs for borates and boric oxides exists, which provide safe conditions for the use of these substances. The alignment of working regulation within Europe would be the more feasible way to cover potential risks than inclusion in Annex XIV.

The authorization should be an proportional procedure. Therefore, the scoring system for prioritization was established and gives a ranking for the substances to be regulated. As long as the authorities did not decide exclusively on the 5th list for prioritization the regulation of the substances on the 6th list does not seem being proportional as the substances on the 5th list have presumably a higher scoring.

5 Comments on the parallel socio-economic public consultation on the 6th priority list to amend Annex XIV of REACH

As described in chapter 4.1 disodium tetraborate and diboron trioxide are used in our company as a casting salt within the casting process of copper alloys.

5.1 Volumes of disodium tetraborate and diboron trioxide used by our company:

- disodium tetraborate: ca. 70 t/year
- diboron trioxide: ca. 1 t/year

5.2 Volume and value of copper alloys affected

In our main production facility in Germany, our company casts ca. 430.000 t copper and copper alloys per year. Most of the copper and copper alloys are made from scrap. The overall share of scrap on the raw material used in the production is ca. 80%.

About 70% of the copper materials (ca. **300.000 t/year**) are casted using casting salts. These materials are mainly brasses (Cu-Zn) and bronzes (Cu-Sn) as well as copper nickel alloys (Cu-Ni), nickel silver (Cu-Zn-Ni) and complex Cu-Zn alloys.

Assuming an average metal price of 4.500 €/t for the copper alloys, the total material value affected is ca. 1,3 billion €/year.

5.3 Significance of disodium tetraborate and diboron trioxide for the production process

Casting salts composed of disodium tetraborate and diboron trioxide are essential for the quality of the casted material and the efficiency of the process.

Unsuitable or no casting salts would result in a significant loss of quality of the casted copper alloy, in particular low quality surfaces of the casted slabs and billets, increased risk of pinholes and pores and lower productivity.

Consequences from the poor product quality are significantly higher scrap rates, extensive post-processing, increased environmental impact and significantly higher production costs

With this, unsuitable or no casting salts are in contradiction to the European targets on increased energy and resource efficiency and reduced greenhouse gas emission.

5.4 Effect on competitiveness

As described above, unsuitable or no casting salts would result in significantly higher production costs.

Semi-finished products from copper alloys are under strong global competition. European copper and copper alloy producers cannot pass on to their customers additional production costs, which are not relevant for their competitors.

This was for example recognized by the European Commission within the discussion of the Emission Trading Schema for greenhouse gas emissions by including the copper sector in the list of sectors being at risk for carbon leakage.

Particularly brass rods, which are exclusively casted with disodium tetraborate and diboron trioxide based casting salts, are under a high global competition. Any increase in prices due to less stable and ineffective production processes will not be accepted by the customers.

Therefore, unsuitable or no casting salts would almost inevitably result in a loss of market share.

5.5 Potential alternatives to disodium tetraborate and diboron trioxide

Alternatives for disodium tetraborate and diboron trioxide based casting salts for copper alloys are not available up to now.

The suitability and fitness for purpose of a casting salt strongly depends on the chemical composition of the materials, which are casted, and on the corresponding process parameters.

For (pure) copper, for example, typically carbon black or graphite can be used to cover the molten material. These substances, however, are not suitable for copper alloys due to chemical reactions with the constituents of the alloy and the formation of gaseous reaction products. Both effects will lead to a poor quality of the casted material.

Recent R&D activities, also performed by our company, show that no adequate alternatives to disodium tetraborate and diboron trioxide based casting salts for copper alloys will be available. Alternative substances may work with respect to an individual function of the casting salt (e.g. lubrication in the mold), but not for the whole range of requirements and functions.

5.6 Conclusion on socio-economic impacts

Casting salts based on disodium tetraborate and diboron trioxide are indispensable for the production of copper alloys, like e.g. brasses and bronzes, which are produced in high volumes.

Casting salts not only enable high quality products but also resource and energy efficient production processes and, with this, contribute to the European targets on resource and energy efficiency.

Alternatives, which provide the same functionality than borate based casting salts, are not available for copper alloys today, and will not be available.

No or unsuitable casting salts will lead to low quality products and to an unacceptable increase in production costs. Due to strong global competition, these additional costs cannot be passed on to the customer and will inevitably result in a loss of market share.