

Annex to CEN-AI02-WI-0015-EN and CEN-AI02-WI-0034-EN on Heavy Metals

Comments on Risk

AMP-E produces exclusively beverage cans made from aluminium alloys with a specified composition, which is monitored in their production and adjusted by the raw material manufacturers.

The agreed specifications include compliance with the heavy metal limits as in Art. 5.4 of Regulation (EU) 2025/40 of the European Parliament and of the Council of 19 December 2024 (PPWR) (sum of Pb, Cd, Hg and Cr VI below 100 ppm), the standard EN 602, and further compositional specifications to ensure the technical performance of the alloys.

While the chromium content is measured in order to fulfil the specifications, chromium VI analytical controls are not carried out in the process as the presence of chromium VI inside the metal can be excluded based on the basic scientific principles for the determination of oxidation states in substances, which dictate that the oxidation state in metallically bound chromium is 0.

Oxidation of chromium 0 to chromium VI on the surface may happen only if the metal is subject to extreme heat (far above 300 °C) for long periods of time that promote oxidation even beyond the most stable state of III and would be visually discernible. This is not possible under the processing conditions at hand.

Moreover, none of our alloys relies on a surface treatment with chromium VI compounds, so there cannot be any residues thereof on the metal surface.

The composition of all our aluminium alloys is uniform within the limits set through the specifications.

Further materials, such as inks and coatings, cannot significantly contribute to the heavy metal (Pb, Cd, Hg and Cr VI) content of the final products due to making up less than 4 % of the packaging weight (please see **(Table 1)** for details) and, according to supplier documentation, containing only unintentional traces of those heavy metals that cannot reasonably be expected to exceed the heavy metal limits even if they were applied to the respective dry film instead of the entire packaging item.

Metals potentially present in machinery parts, which the cans and ends may touch, are bound through metallic bonding and cannot be transferred into cans during the production process or, in case of equipment in contact with corrosive agents, would be rinsed off in the following process steps.

No processing agents with intentionally added heavy metals are used. Moreover, any contact with machinery is short due to the high line speeds.

This means overall that the contribution of the production process to the heavy metal levels in cans and ends is negligible.

Transport packaging materials may contain materials at levels below the limits of the PPWR but will not release them under regular conditions of use due to the metal salts being embedded in the material matrix. In the case of cardboard layers and paper sleeves, mobilisation through large amounts of (rain) water needs to be considered. However, for this kind of contamination to be significant, the water from the materials would have to drip into the cans, which in practice would lead to the affected cans being discarded before filling due to, for example, the increased off-taste risk.

Table 1 Can and end composition

article	Nominal total weight [g]	Nominal non-metal material weight [g]	non-metal material [%]
DIA 200 end	2,3	0,060	2,6
DIA 202 end	2,5	0,064	2,6
15cl slim	6,0	0,15	2,5
18,7cl	8,1	0,2	2,5
20cl slim	7,6	0,2	2,6
20cl slim thick wall	9,2	0,3	3,3
25cl slim	7,8	0,2	2,6
25cl slim thick wall	9,4	0,3	3,2
33cl std	9,7	0,3	3,1
33cl slk	9,6	0,3	3,1
35,5cl	10,0	0,3	3,0
37,5	11,7	0,3	2,6
44cl std	11,4	0,3	2,6
47cl	13,1	0,3	2,3
50cl std	12,4	0,4	3,2
53cl	12,4	0,4	3,2
55cl	13,5	0,4	3,0
56,8cl	14,5	0,4	2,8

Analytical Results

The analytical data that has been provided by the aluminium suppliers and stems either from their process controls or test reports issued by external laboratories is summarized in the table below.

Table 2 Supplier analysis data (can aluminium alloy: 3104, end aluminium alloy: 5000 series)

tested material (supplier + description)	heavy metals (Pb, Cd, Hg, Cr VI) content [mg/kg]	type of analysis
Supplier A can alloy	n.d. (Cd < 5, Cr VI not measured, other: < 20)	one-time measurement from process control
Supplier B can alloy	average 30,2 maximum 55,4	aggregated process control data
Supplier B end alloy	average 1,2 maximum 25,4	aggregated process control data
Supplier C can alloy	30 (Pb 30, Cr VI < 0,1 µg/cm², other: < 2)	accredited laboratory test report (CTI)
Supplier D endstock (coated)	n.d. (Cr VI < 8, other: < 2)	accredited laboratory test report (CTI)
Supplier D bodystock (2 test reports with identical results)	n.d. (Cr VI < 0,1 µg/cm², other: < 2)	accredited laboratory test report (CTI)
Supplier E end alloy	n.d. (Cr VI < 0,1 µg/cm², other: < 2)	accredited laboratory test report (CTI)
Supplier E endstock	n.d. (Cr VI < 0,1 µg/cm², other: < 2)	accredited laboratory test report (CTI)
Supplier F end alloy	n.d. (Cr VI < 0,1 µg/cm², other: < 2)	accredited laboratory test report (CTI)
Supplier G can alloy	maximum 98 (maximum per analyte*: Pb 98, Cd 1, Hg 13; Cr VI not measured) through scrap contaminated with a piece of lead regular < 80	aggregated process control data
Supplier H endstock	11 (Pb 11, Cr VI not measured, Hg < 1,5, Cd < 0,5)	accredited laboratory test report
Supplier H bodystock	46 (Pb 45, Cd 1, Cr VI not measured, Hg < 1,5)	accredited laboratory test report
Supplier I endstock	n.d. (Cr VI n.d., other: < 1)	laboratory test report
Supplier J end alloy	22 (Pb 19, Hg 3, Cr VI not measured, Cd < 1)	one-time measurement from process control
Supplier J can alloy	36 (Pb 31, Hg 4, Cd 1 Cr VI not measured)	one-time measurement from process control

n.d. = not detected; * do NOT sum up - those are maximum values from different batches

The results in **(Table 2)** show heavy metal contents consistently below the threshold of 100 mg/kg. Additionally, they show that **it is not possible to assign any fixed heavy metal content other than < 100 mg/kg to the materials or any articles produced from them.** The use of aluminium scrap as a resource to produce alloys sometimes results in increased lead contents, which, however, stay below the applicable limit.

This is supported by the values provided for can alloys being higher than those for end alloys as the latter typically have a lower recycled content for technological reasons.

While the adjustment of the metal composition according to our specifications and no intentional use of heavy metals (Pb, Cd, Hg and Cr VI) in the organic materials, such as coatings, are the main pillars of conformity, AMP-E has submitted two samples, each one representative for

- finished ends, manufactured from the aluminium alloy from the 5000 series, and another representative for
- finished cans manufactured from the aluminium alloy 3104,

to heavy metal testing at SGS institute Fresenius.

Results in **(Table 3)** illustrate the effectiveness of the concept with analytical results for cans and ends supplied.

The cans were sampled directly after production, whereas the ends were placed in the regular end sleeves. As stated in the previous section, further storage in transport packaging does not affect the heavy metal levels in the items.

The articles tested (SGS Test report No. **7917701**) are the following:

Table 3 Finished can and end analytical data

sample code Ardagh/ SGS	heavy metals (Pb, Cd, Hg, Cr VI) content [mg/kg]	description
26.0153.09/ 260191324	17 (17 lead, Hg < 0,5, other: < 1)	DIA 202 end
26.0153.10/ 260191325	35 (35 lead, Hg < 0,5, other: < 1)	250 ml can

The samples tested were manufactured with materials from European suppliers and show elevated lead contents due the above-mentioned use of aluminium scrap in the production of can alloys. The determined contents are very well below the limit of PPWR Art. 5.4.

Conclusion of the Risk Assessment and Management Related to PPWR 2025/40 Article 5.4

Based on the risk assessment carried out for our products, AMP-E confirms that our cans and ends enable compliance with the limit of 100 mg/kg for the sum of heavy metals by not reaching the thresholds.

The can and end sizes do not have any notable impact on the heavy metal contents due to the uniform composition **(Table 1)**. All materials used, follow the same specification with respect to heavy metals and are therefore equivalent.

Kindly note that AMP-E is not responsible for any processing, filling or other use of the articles after the point of delivery or for the overall conformity of the customer's packaging with the PPWR.

A documented customer risk assessment for operations, which is not under the control of AMP-E, is required to relate the certificates CEN-AI02-WI-0015-EN and CEN-AI02-WI-0034-EN to such packaging.

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