

Stainless steel in BASTA and Byggvarubedömningen

BASTA and Byggvarubedömningen (BVB) have decided to deviate from the requirement for assessment at substance level for stainless steel.

Stainless steels are alloys that consist primarily of iron and chromium, in many cases also include nickel. Nickel can be found in relatively high concentrations. This was the main reason why stainless steels previously did not meet the criteria in BASTA and BVB. It is known that nickel can cause damage to health with prolonged or repeated exposure. Nickel can also cause allergic skin reactions, and is suspected of causing cancer.

The Finnish Institute of Occupational Health¹ conducted a survey of the state of knowledge regarding the environmental and health properties of stainless steel, 2010 in a literature review. The scientific quality and conclusions of the study were confirmed by an independent expert², hired by BASTA. The Finnish Institute of Occupational Health conducted a follow-up to the 2020-survey³, on behalf of Team Stainless. The results have also been published in an article⁴ in 2022, after scientific review (peer-review).

In short, the conclusions from the surveys were that stainless steel from a toxicological perspective should be seen as a separate substance and be assessed based on *the properties of the alloy*, not the constituent metals. The reasoning is supported by the European legislation on the classification of chemicals (CLP)^{3,4} regarding alloys.

Studies show that the release of nickel from stainless steel alloys is much lower than from pure nickel, according to some studies, more than 1,000 times lower. One conclusion from this is that the alloys have very low toxicity and are not carcinogenic or cause allergies. There are differences in the release of nickel from different types of stainless steel, but these are very small compared to the release from the pure metal. The low emission is linked to the fact that the alloys in stainless steel create a protected layer in contact with air. It normally provides good corrosion resistance.

However, sulphur-alloy steels (stainless free-cutting steels) used for their chip-separating properties show poorer corrosion resistance and thus a higher nickel yield. In the EU, there are restrictions that mean that materials with high nickel release should not be used in applications with continuous contact with the skin. Although construction products do not normally come into continuous contact with skin, it is important to take into account this increased risk of exposure to nickel when assessing construction products containing stainless steel.

Another important reservation for obtaining an exemption from assessment at substance level in BASTA and BVB is that stainless steel alloys may not contain substances with phase-out properties, as defined in the Swedish Chemicals Agency's prioritization tool PRIO⁵. In order to achieve the national environmental quality objective *Non-Toxic Environment*, substances with phase-out properties are not considered suitable in construction products, regardless of the properties of the alloy.

The assessment of stainless steel must therefore be made:

- based on information about the steel grade and steel standard and
- of the stainless steel as a *separate substance* (based on *the properties of the alloy* and not those of the constituent metals).

Against this background, the assessment is that the stainless steel meets the criteria in BASTA and BVB if it meets 1 or 2:

1. The steel grade can be found in the list "Stainless steel in the construction sector, examples of commonly used steel grades that meet the content criteria according to BASTA and BVB for non-toxic construction" from Jernkontoret and the Swedish Steel Building Institute.
or
2. The steel grade does not contain substances with phase-out properties above the concentrations specified in the criteria and meets any of a, b or c:
 - a. contains less than 1% nickel
or
 - b. contains less than 0.1% sulphur
or
 - c. that the standard in vitro test (EN 1811, CEN reference test method) shows that the release of nickel is < 0.5 µg/cm²/week in accordance with CLP

For questions regarding specific goods, please contact your stainless steel supplier. For more general questions about stainless steel, contact Jernkontoret or the Swedish Institute of Steel Construction.

Jernkontoret and the Swedish Institute of Steel Construction's list is based on the steel grades that were included in FIOH's survey. The selection criteria were that they a) meet the nickel emission limit of the "Nickel Directive" by a wide margin (Annex XVII, entry 27 of the REACH Regulation) and b) are commonly used in the construction sector.

References

1. Santonen, T., Stockmann-Juvala, H., Zittin, A. (2010). Review on toxicity of stainless steel. Finnish Institute of Occupational Health. ISBN 978-952-261-039-3.
http://www.ttl.fi/en/publications/Electronic_publications/Documents/Stainless_steel.pdf
2. Jönsson, Anders (2012). Evaluation of human and ecotoxicological properties of stainless steel. IVL Swedish Environmental Research Institute.
3. Taxell, P., Huuskonen, P. (2020). Review on toxicity of stainless steel: 2020 update. Finnish Institute of Occupational Health.
4. Taxell, P., Huuskonen, P. (2022) Toxicity assessment and health hazard classification of stainless steels. Regulatory Toxicology and Pharmacology 133.
<https://doi.org/10.1016/j.yrtph.2022.105227>
<https://www.researchgate.net/publication/361875065>
5. European Chemicals Agency, ECHA (2024). Guidance on the Application of the CLP Criteria. New: [Guidance on the Application of the CLP Criteria Part 1](#) + Annex XVII entry 27 [3bbe9024-52a6-8e63-5581-e686331eb459](#) (2026-02-20)
6. Swedish Chemicals Agency (2026). Prioritization guide PRIO-tool
<https://www.kemi.se/prioguiden/start> (2026-02-20)