German Federal Institute for Risk Assessment

FAQ

7 May 2025

Some portafilter espresso machines release too much lead

→ Changes compared to the version dated 12 December 2013: EU transitional values abolished, additional BfR publications on the subject and new reference to an examination by Stiftung Warentest in 2021.

Following the discovery of quantities of lead released from portafilter espresso machines after the descaling process, the German Federal Institute for Risk Assessment (BfR) has drawn up questions and answers to inform consumers.

How did the BfR become aware of the release of lead from espresso machines?

In 2013, the BfR tested eight brand-new coffee machines for domestic use as part of a research project examining the release of metals from metallic materials and food contact materials and their transfer into food. These machines consisted of three portafilter espresso machines, three coffee pod machines and two coffee capsule machines.

Which machines release a lot of lead?

Excessive lead release was detected in portafilter espresso machines.

Did all of the portafilter espresso machines tested release lead?

There were substantial differences in lead release measured for the different types of coffee and espresso machines. One of the portafilter machines tested released large amounts of lead compared to the coffee pod and capsule machines tested, especially after descaling, while others released hardly any lead.

Will the BfR publish product names of the analysed coffee and espresso machines?

The BfR does not intend to publish product and manufacturer names. The BfR investigations were carried out as part of a research project. Due to the small number of samples, the data

is not representative. Furthermore, the BfR is not involved in the control of food and consumer goods. This is the responsibility of the monitoring authorities of the federal states ('Laender'), and the BfR has informed the monitoring authorities of the test results accordingly.

What advice does the BfR have for consumers?

After descaling, portafilter espresso machines can release large amounts of lead. To reduce lead absorption, the BfR recommends that consumers rinse the machines thoroughly after descaling. The rinsing steps specified by the manufacturer should be repeated. In cases of daily use, the BfR additionally recommends, as also prescribed by the manufacturers, always carrying out a rinsing step (preparation with water only) before the actual preparation of espresso or coffee.

Why does the descaling process release lead from metal components of the machines?

It is possible that the acidic descaling products release lead from metal components.

What metal components of the espresso machines does the lead come from?

The BfR does not know where the lead in the samples comes from. The BfR assumes that components within the machines and/or any soldered joints may contribute to the release of lead.

Is there a legal limit?

In the EU, there is no legally defined limit for the release of metals from metallic food contact materials. However, the Council of Europe has recommended a release limit for lead that is based on the permissible lead content in drinking water. The Council of Europe resolution on metals and alloys for food contact sets a specific release limit of 10 micrograms (µg) per kilogram (kg) of food for the release of lead into food. Further information on the resolution can be found on the Council of Europe website: https://www.edqm.eu/en/metals-and-alloys-used-in-food-contact-materials-and-articles.

Have any other investigations produced results on the release of metals from coffee machines?

In 2007 and 2011, the Stuttgart Chemical and Veterinary Investigation Office carried out research into the release of lead from fully automatic coffee and espresso machines. In 2007, three out of 17 machines analysed showed increased lead release. An improvement in quality was observed in the second investigation period, in which no lead release was detected (limit of determination for lead at 0.005 milligrams (mg) per litre (l) of test water).

In 2021, the German consumer organisation Stiftung Warentest examined portafilter machines for the release of chemical elements (magazine "test", December 2021). In the test, two out of seven machines released increased amounts of lead.

Further information on metals from coffee machines and electric kettles on the BfR website:

BfR Communication "**Release of metals from coffee machines and electric kettles**"
https://www.bfr.bund.de/en/release_of_metals_from_coffee_machines_and_electric_kettles-197164.html

You can also find information at:

Müller, F. D., Hackethal, C., Schmidt, R., Kappenstein, O., Pfaff, K., & Luch, A. (2015). **Metal release from coffee machines and electric kettles.** Food Additives & Contaminants: Part A, 32(11), 1959-1964.
https://doi.org/10.1080/19440049.2015.1086929

Baden-Württemberg testing centres: "**Lead and nickel emissions from fully automatic coffee and espresso machines have been reduced"** (*in German*)
https://www.ua-bw.de/pub/beitrag.asp?subid=1&Thema_ID=3&ID=1559

About the BfR

The German Federal Institute for Risk Assessment (BfR) is a scientifically independent institution within the portfolio of the Federal Ministry of Food and Agriculture (BMEL) in Germany. The BfR advises the Federal Government and the States ('Laender') on questions of food, chemicals and product safety. The BfR conducts independent research on topics that are closely linked to its assessment tasks.

This text version is a translation of the original German text which is the only legally binding version.

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