

## Questions and answers on tableware and kitchen utensils made of melamine-formaldehyde resin

FAQ of the BfR from 25 November 2019

Melamine-formaldehyde-resins (MFR) are plastics made of melamine and formaldehyde. The material is shatterproof and usually has a smooth surface. Because of these properties, it is also used for the production of tableware and kitchen utensils. In recent years, alternative products such as bamboo fibres have been used increasingly as fillers for the plastic. These products are often advertised as “bamboo ware”. One typical application are reusable “*coffee to go*” cups.

For both melamine and formaldehyde European limit values exist that specify maximum amounts which may be released from articles into food (migration limits).

Results of investigations conducted by the official control laboratories of the federal states and the German Federal Institute for Risk Assessment (BfR) have shown that plates, cups, bowls and other consumer articles made from MFR can release melamine and formaldehyde when used for cooking food. In some cases, the quantities released were significantly higher than the migration limits and the health-based guidance value derived by the BfR. When filling with very hot foods (e.g. tea, coffee), high amounts of melamine or formaldehyde may also be released. In addition, long-term tests by the official control laboratories of the federal states and the BfR showed that MFR is not stable when in contact with hot food. The plastic is eroded and degrades.

Therefore, from the BfR’s point of view, dishes made of MFR are not suitable for contact with hot liquid foods (e.g. coffee, soup or infant formula) or for use in microwave ovens.

Below, the BfR has put together questions and answers on kitchen utensils and tableware made of MFR.

### **What is melamine-formaldehyde-resin?**

Melamine-formaldehyde resins (MFR) are plastics that are rigid and shatterproof and therefore often used in the manufacture of children's and camping products. In addition, there are kitchen utensils such as plates, bowls, cups or cutlery that are made of MFR. The starting materials for the production of MFR are melamine and formaldehyde. Furthermore, the production of the plastic always includes the addition of certain fillers. In recent years, alternative fillers such as bamboo fibres are being increasingly used. The respective finished products are therefore often advertised as “bamboo ware” (e.g. “*coffee to go*” cups). However, they are plastic products.

### **What is “bamboo ware”?**

Products advertised as “bamboo ware” generally consist of melamine-formaldehyde-resin (MFR), which includes alternative materials as fillers, in particular bamboo fibres. Nevertheless, these are plastic products.

### **“Bamboo ware” is often advertised as being environmentally friendly. Is that correct?**

Product descriptions for “bamboo products” such as “particularly environmentally friendly, biodegradable or made exclusively from renewable raw materials” are incorrect. MFR is a non-biodegradable plastic - even if alternative fillers are added to it. In this context, the Chemical and Veterinary Investigations Office of Stuttgart denotes many advertising

statements of “bamboo ware”-providers as a consumer deception ([https://www.ua-bw.de/pub/beitrag.asp?ID=2609&subid=1&Thema\\_ID=3&lang=DE](https://www.ua-bw.de/pub/beitrag.asp?ID=2609&subid=1&Thema_ID=3&lang=DE)).

### **Can melamine and formaldehyde be released from melamine-formaldehyde-resin products?**

The BfR and the official control laboratories of the federal states of Germany have examined the amounts of formaldehyde and melamine that are released from tableware and kitchen utensils made from MFR during their use in contact with hot food. The results show that in some cases high levels of melamine and formaldehyde can migrate into the food. Furthermore, the data revealed that products marked as “bamboo ware” release on average significantly more melamine and formaldehyde than “conventional” MFR products.

### **Does the material degrade during use?**

Yes, high temperatures can cause degradation of MFR and consequently lead to an enhanced release of melamine and formaldehyde.

This process becomes evident from the fact that the material loses its shine. Damage to the surface structure accelerates the decomposition process. These effects can occur during cooking, especially when acidic foods, such as many fruits and vegetables, are involved.

Current data (link to the opinion) show that a release of high amounts of melamine and formaldehyde can also occur when filling with hot liquids, accompanied by degradation of the material.

### **What limit values exist governing the migration of melamine and formaldehyde into food?**

The EU Regulation on plastic materials and articles intended to come into contact with food (Regulation (EU) No. 10/2011) specifies the maximum amounts of melamine and formaldehyde that are allowed to migrate from materials that come into contact with food into (specific migration limit, SML) it. The SML for Melamine is 2.5 milligrams per kilogram food, and the SML for formaldehyde is 15 milligrams per kilogram food.

It is important to know that exceeding the specific migration limits once does not necessarily pose a health risk.

### **What health risks can be associated with the intake of melamine and formaldehyde?**

**Melamine:** In long-term animal experiments on rodents, the formation of bladder stones and an associated increased occurrence of bladder cancer were observed. In addition, damage to the kidneys occurred. Milk powder contaminated with high levels of melamine in 2008 led to severe symptoms, including death from kidney failure, in infants in China. However, the amounts of melamine consumed were several orders of magnitude higher than the amounts determined for the transitions from kitchen utensils and tableware made of melamine-formaldehyde-resin.

**Formaldehyde:** This substance is irritating to skin and mucous membranes and can cause cancer in the nasopharyngeal region after inhalation. On the other hand, after ingestion via food or drinking water (oral), no cancer development was observed. In a long-term animal experiment, however, inflammation and increased cell growth in the stomach area were found.

### **How can consumers recognise whether tableware and kitchen utensils are made of melamine-formaldehyde-resin (MFR)?**

Consumers can only identify whether tableware or kitchen utensils are made of MFR, if manufacturers label the items or their packaging. There is currently no labelling obligation for MFR tableware and kitchen utensils. In many cases, labels can be found on the objects themselves or on the packaging. Products labelled as “bamboo ware” (e.g. “coffee to go” cups) can generally be assumed to be made of MFR.

In some cases, manufacturers also state that the product may come in contact with food only for a limited time and only up to a certain temperature limit. The BfR does not consider such labels to be helpful from the point of view of consumer health protection if they do not apply to the usual use of the articles in food preparation.

### **What advice does the BfR give to consumers when using tableware and kitchen utensils made of melamine-formaldehyde-resin?**

With regard to the release of melamine and formaldehyde at high temperatures, the BfR recommends that no MFR kitchen utensils or tableware be used in contact with hot food. This applies to both cooking and filling with hot food (cooking ladles, “coffee to go” cups, and bowls for the preparation of infant follow-on formula etc.). MFR items should also not be used to heat food in the microwave.

However, no health concerns exist for the use of MFR products at low temperatures, such as cold or lukewarm foods.

Since the material can be degraded and destroyed in particular at high temperatures, consumers should pay attention to visible signs of wear on the surface of their MFR tableware and replace it in case of damage.

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