



Contamination of oily foods in glass jars from the gasket of the closure

Metal closures for glass jars contain a gasket sealing the lid against the rim of the jar. It commonly consists of plasticized PVC. The plasticizers may be the cause of non compliant products, either by the use of banned plasticizers or by the exceedance of migration limits.

To render PVC suitable as a sealant, it is turned soft by adding around 40 % plasticizers. Edible oil may extract these almost completely, which means that easily about 0.1 g (100 mg) plasticizer gets into the food.

There is no *acute* danger in ingesting plasticizers. The risk is from *chronic* intoxication, i.e. damage created over many years of exposure to the compounds.

To be compliant with European* and Swiss** legislation, lids must respect the following rules:

1. the plasticizer must be authorized (EU positive list in Regulation 10/2011)
2. no exceedance for the amount transferred into the food (specific migration limit, SML) specified in the same regulation
3. if no SML is given for a plasticizer, it must respect the generic specific migration limit of 60 mg/kg or 10 mg/dm² in food
4. The sum of the plasticizers transferred to food (SML(T) 32) must not exceed 60 mg/kg or 10 mg/dm²

If the jar content is below 500 ml or g, the limits are calculated in mg/dm². The amount in mg transferred into the food is divided by the total internal surface of the jar and the lid in dm². This value is compared to the legal limit derived from the value in mg/kg and divided by 6.

High migration is observed for products containing free edible oil on the top surface of the food and in contact with the lid when the jar is moved. Water does not extract plasticizers in relevant amounts. Oil or fat enclosed in the product, e.g. in olives (in an aqueous environment), is no problem. Usually well emulsified oil, e.g. in mayonnaise, is no problem either.

Food producers are advised as follows:

1. Immediately stop using closures with gaskets plasticized with phthalates and other plasticizers not approved in Europe. Enforcement laboratories in Europe will continue stopping their sale when migration into the food is unacceptable and spread the information by the EU rapid alert system RASFF.
2. Migration from gaskets largely or exclusively plasticized with ESBO or another monomeric plasticizer like ATBC or DINCH tends to far exceed the legal limit when in contact with unsuitable foods.
3. If the gaskets continue to consist of PVC, polyadipates are presently the most promising authorized plasticizers for complying with the legal limits. Owing to the high viscosity of the most suitable polyadipates, they may be mixed with others.
4. Conventional migration testing by simulation fails in predicting long-term migration from lids. The development of acceptable gaskets requires long term testing with edible oil.
5. European legislation requires a declaration of compliance with legal requirements (Regulation 10/2011). This declaration should contain a specification on the range of applications, such as a confirmation that a given lid is suitable for oily products.

* http://ec.europa.eu/food/food/chemicalsafety/foodcontact/legisl_list_en.htm

** http://www.admin.ch/ch/d/sr/c817_023_21.html