

Statement regarding the Migration Behaviour of the UV Coatings developed by VEGRA



(This statement does NOT apply to UV coatings produced by Graphokem, Italy.)

Initiated by an e-mail of the German "Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz" (Federal Ministry of Food, Agriculture and Consumer Protection) with regard to contaminated cereal packs we would like to make the following statement:

1. According to the above mentioned letter, in the filling of cereal packs up to 4.1 mg/kg benzophenone and up to 3.7 mg/kg 4-methyl-benzophenone were found. For benzophenone, the TDI concentration is 0.01 mg/kg body weight/day. For 4-methyl-benzophenone, so far no values have been defined. The European Commission was assigned to carry out a risk evaluation for 4-methyl-benzophenone.

The packing was allegedly printed in Belgium - we do not know the printing company. From a letter by company Actega we learned that there was no migration of the vapour phase but the problem arose from smudging in the pile. A product recall was not ordered due to this message. However, it was recommended that the offset printers and coaters should not use UV inks and UV coatings.

2. Possible migration influences in printed packagings are:
 - offset solvents like petrol, esters, laureates, palmitates, copra or rapeseed esters
 - plasticizers like phthalates, adipates, sebacates or sulfonamides
 - photoinitiators, mainly benzophenone, ITX and many Irgacure types or their decomposition products
 - acrylates with a mole weight < 500 like e.g. hdda, dpgda, tpgda, tmpta and others
 - The migration of various organic components from fountain solutions is usually negligible.
 - After Euro lab had first detected ITX in dried milk for babies (TPK), it seems that the volatile transfer has been verified. Heavy transfer of benzophenones is at the beginning of authority's observations. 4-methyl- and 3-methyl-benzophenones will certainly be observed, too.

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3. We take the migration topic very seriously. Therefore please see our following statement:
- **All VEGRA products are basically free of 4-methyl-benzophenone.**
 - Photopolymerisation happens in a quantitative way as the medium molecular weight of the coating lies between 500 and 600 Dalton. The dried films of the VEGRA UV coatings are odourless and tasteless as well as free of migrating components.
The photoinitiators used are macromolecular and they are polymerized into the coating system during the UV drying process.
 - Basic condition for a migration-free ink and coating film is a sufficiently intensive light exposure by UV beamer. The offered intensity will vary from case to case, depending on whether light or dark ink shades are coated inline. Therefore, we recommend to adapt the UV dryer capacity exactly to the job to be printed.
 - The film formation of the coating can easily be tested by rubbing a piece of cotton wool, drenched with acetone or MEK, on the coating surface. The coating film should remain undamaged after at least 10, better 15 double rubs.
 - The formulation of cheap imports from Asia are mostly not migration-free.
 - Attached please find a headspace chromatography of our current products.

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Supplement of April 2nd, 2009:

As already explained in the above statement, we have in the meantime reworked our MF UV coating range.

Under the name of "**UV Coating ... MF-2**" our former "UV Coatings MF-1" have now been replaced by the latest up-dated formulation.

The latest formulation does not contain benzophenone or benzophenone derivatives. If an appropriate exposure to light is provided, no residues of detectible photoinitiators will be present in the dried coating film.

We would like to point out that the UV Coating MF-2 developments are very clean formulations. The content of impurities lies below the allowed level of 10 ppb. This means in fact that the **coating film is odour and taste free, free of TXIB and other problematic compounds and it is absolutely migration-free**. We are sure that a Robinson-test will confirm the results of our Headspace-Chromatographic analysis and we hope we could contribute with this information to a stabilisation in the market.

Furthermore, we found that due to the polymerisation of the applied coating film, higher gloss values and considerably quicker drying speeds are achieved.

Aschau am Inn, 02 April 2009 - 001/lh


Albert Uhlemayr
Managing Director

Annexe: Headspace-Chromatography of UV Coatings MF-1 and MF-2
VP 1038/50 and VP 10169/50

Comparison of the 4 MF 1/2 wet varnishes - on a constant scaling and with full curing

Suppression of photoinitiator Dar1173 is obviously seen as on dried proofs. Level of benzophenone (traces in MF-1) is now negligible. No further photoinitiators are seen here. Presence of silicone in 10169 is still confirmed by 73 ion peaks. Levels of toluene and phenol pollutants are constantly low, coming from acrylates and oligomers. GPTA is profiled by its low trace of GA glycerol mono acrylate (impurity).

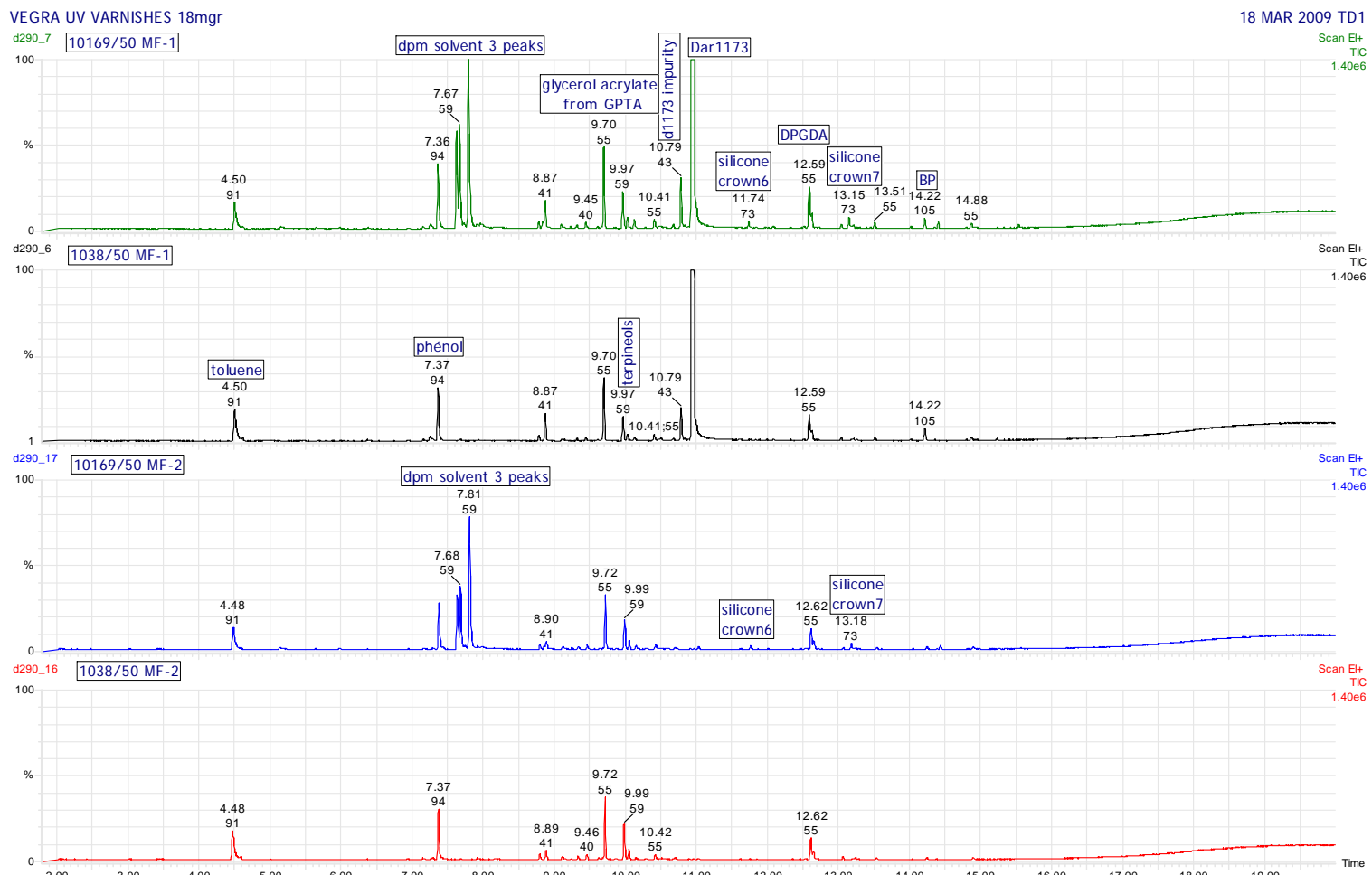


FIGURE 8