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XII. Unsaturated Polyester Resins

As of 01.01.2010

There are no objections to the use of unsaturated polyester resins in the manufacture of commodities in the sense of § 2, Para. 6, No 1 of the Food and Feed Code (Lebensmittel- und Futtermittelgesetzbuch), provided they are suitable for their intended purpose and the following conditions are met:

1. The use of starting materials for unsaturated polyester resins is subject to the Commission Regulation (EU) No 10/2011.

The evaluation presented in the following refers to polymers from the following monomeric starting substances:

Fumaric acid

Maleic acid

Methacrylic acids

Adipic acid

Phthalic acid

Isophthalic acid

Terephthalic acid

Hydrogenated resp. halogenated phthalic acids as far as covered by the positive list of the Commission Regulation (EU) No 10/2011

Rosin acids

Aliphatic and aliphatic substituted mono-Tricyclodecane di or polyhydric alcohols up to C₁₈ as far as covered by the positive list of the Commission Regulation (EU) No 10/2011

Styrene

Acrylic and methacrylic acid esters of alcohols C₁-C₄ as far as covered by the positive list of the Commission Regulation (EU) No 10/2011

Tricyclodecandimethanol

2. Additives permitted by the Commission Regulation (EU) No 10/2011 may be used in accordance with the restrictions laid down therein. In addition to these, only the following production aids, used during manufacture and processing, or their conversion products, may be contained in the raw resin or in finished products made from it, in the maximum amounts given (based on the resin):
 - a) Accelerators
 - Tertiary amines derived from aniline- or toluidine¹, in total max. 0.1 % nitrogen
 - Naphthenic acid, cobalt salt, octanoic acid, cobalt salt, in total max. 0.03 % cobalt
 - Octanoic acid, copper salt, max. 0.005 % copper.

¹ Extracts obtained in accordance with Section A II No 1 and B of Communication 1 on the "testing of plastics used for commodities in the sense of the Food Act (Lebensmittelgesetzes)" in Bundesgesundheitsblatt 4 (1961) 189, must contain no more than 1 ppm nitrogen.

- b) Catalysts
- | | | |
|--|---|---------------------------|
| Benzoyl peroxide | } | in total
max.
3.0 % |
| Cumyl hydroperoxide | | |
| Cyclohexanone peroxide | | |
| Di-tert-butyl peroxide | | |
| Methylethylketone peroxide | | |
| tert-Butyl perbenzoate | | |
| tert-Butylperoxy-(2-ethylhexanoate) | | |
| tert-Butyl hydroperoxide | | |
| Acetylacetone peroxide | | |
| Methylisobutylketone peroxide | | |
| tert-Butyl-peroxy-3,5,5-trimethylhexanoate | | |
| 2,2-Bis-(tert-butylperoxy)-butane | | |
- The following may be used as pasting agents for the above catalysts:
- | | | |
|-----------------------------------|---|---------------------------|
| Dimethyl phthalate | } | in total
max.
3.0 % |
| Dibutyl phthalate ² | | |
| Diisobutyl phthalate ³ | | |
| Dicyclohexyl phthalate | | |
| Triethyl phosphate, max. 2.0 % | | |
- c) Inhibitors
- Dihydric (incl. substituted) phenols, max. 0.05 %⁴

3. In finished products made from a combination of resin and fibres, which are subject to mechanical wear, the fibres must not be in direct contact with the surface.
4. Before finished products enter the market they must be sufficiently tempered⁵ and subsequently thoroughly washed for 1 – 2 hours in hot water at 80 °C, or steam treated. The finished products must not test positively for peroxides⁶.
5. Based on resin content, volatile organic components and water-soluble components must not exceed 25 mg/dm² and 5 mg/dm², respectively⁷.

² Permitted in accordance with the Commission Regulation (EU) No 10/2011. Migration of this substance into foodstuffs is regulated by the Commission Regulation (EU) No 10/2011.

³ Restrictions applying to dibutyl phthalate also apply to diisobutyl phthalate.

⁴ In parts permitted in accordance with the Commission Regulation (EU) No 10/2011. Migration of this substance into foodstuffs is regulated by the Commission Regulation (EU) No 10/2011.

⁵ Tempering must be carried out so that the requirements of 5. are met.

⁶ See 58th Communication on the testing of plastics, Bundesgesundheitsblatt 40 (1997) 412

⁷ Compare 27th Communication on the testing of plastics (determination of volatile organic components in commodities made from unsaturated polyester resins), Bundesgesundheitsblatt 16 (1973) 332, and also the 15th Communication on the testing of plastics, Bundesgesundheitsblatt 13 (1970) 203.