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VII. Polypropylene

As of 01.06.2019

There are no objections to the use of polypropylene 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 polypropylene 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:

- a) Monomer: Propylene
- b) Comonomers:

Ethylene	}	<i>in total max. 10 %</i>
Butylene		
4-Methylpentene		
3-Methylbutene		

If butylene is used exclusively as comonomer it may be used up to 12 %, if ethylene is used exclusively as comonomer it may be used up to 15 %.

The melt flow index (see DIN EN ISO 1133) of the polypropylene must not exceed 100 (2.15 kp, 230 °C) and the melting point of cristallites must not be below 155 °C.

2. Additives permitted by the Commission Regulation (EU) No 10/2011 may be used in accordance with the restrictions stipulated therein. In addition to these, the raw polymer or finished products may contain only the following production aids¹, used during manufacture and processing of the polymer, in the maximum amounts given:

- a) Catalyst residues²:

Oxides³ of calcium, aluminium, silicon, titanium, chromium, vanadium, zirconium and hafnium, in total max. 0.1 %. The finished products must contain no more than 10 ppm chromium, no more than 20 ppm vanadium, no more than 100 ppm zirconium and no more than 100 ppm hafnium.

p-Ethoxybenzoic acid ethyl ester, max. 0.032 %⁴

Ethylene-bis-(4,5,6,7-tetrahydroindenyl)zirconium dichloride, supported on silica/methylalumoxane support, max. 250 mg/kg polymer

Bis(C₁₆-C₁₈-alkyl)methylamine, residue in polymer max. 30 mg/kg.

¹ Such production aids include molecular weight regulators which are occasionally used, e.g. bis(tert-butylperoxyisopropyl)-benzene, max. 0.1 %, 2,5-dimethyl-2,5-di-(tert-butylperoxy)hexane, max. 0.1 %, di-tert-butyl peroxide, max. 0.1 %, 3,6,9-triethyl-3,6,9-trimethyl-1,2,4,5,7,8-hexoxonane, max. 0.1 % or 3,6,9-trimethyl-3,6,9-tris(ethyl and/or propyl)-1,2,4,5,7,8-hexoxonane, max. 0.08 %, tert-butyl peroxyisopropyl carbonate, max. 0.5 %. The surface of commodities made using the above substances must not test positively for peroxides. (see 58th Communication on the testing of plastics, Bundesgesundheitsblatt 40 (1997) 412).

² Catalysts, as such or in the form of their decomposition products, not contained in the finished product are not considered.

³ Aluminium oxide, calcium oxide, silicon dioxide and titanium dioxide are permitted as additives in accordance with the Commission Regulation (EU) No 10/2011.

⁴ The residual content of diethyl sulfate in this catalyst must not exceed 10 mg/kg.

- Dichloro(*rel*-(1*R*, 1'*R*)-(dimethylsilylene)-bis-(1,2,3,3*a*,7*a*-*h*)-2-methyl-4-pentyl-1*H*-indene-1-ylidene))zirconium, supported on silica/methyl-alumoxane support, max. 250 mg/kg polymer.
- Isopropyl myristate, max. 0.012 %^{5, 6}
- 5-*tert*-butyl-3-methyl-1,2-benzenediol dibenzoate, the migration of this substance must not exceed 0.05 mg/kg foodstuff or simulant.
- 2',2'''-((((1*R*,2*R*)-cyclohexane-1,2-diyl)bis(methylene))bis(oxy))bis(3-(9*H*-carbazol-9-yl)-5-methyl-[1,1'-biphenyl]-2-ol), the migration of this substance must not exceed 0.05 mg/kg foodstuff or simulant.⁶
- b) Residues of emulsifying agents:
- Addition products of ethylene oxide to natural fatty acids, max. 0.2 %
- or
- Nonylphenoxypoly-(ethylenoxy)-ethanol (degree of ethoxylation, 3-14), max. 0.01 %

⁵ During the polymerisation with a catalyst containing isopropyl myristate, the by-product 3-hexadecanol can be formed. Only up to 0.05 mg/kg of this substance may migrate into the foodstuff or food simulant, respectively

⁶ For the verification of compliance with this recommended migration limit it is feasible to use the fat reduction factor following the conditions defined in annex V of Commission Regulation (EU) No 10/2011.