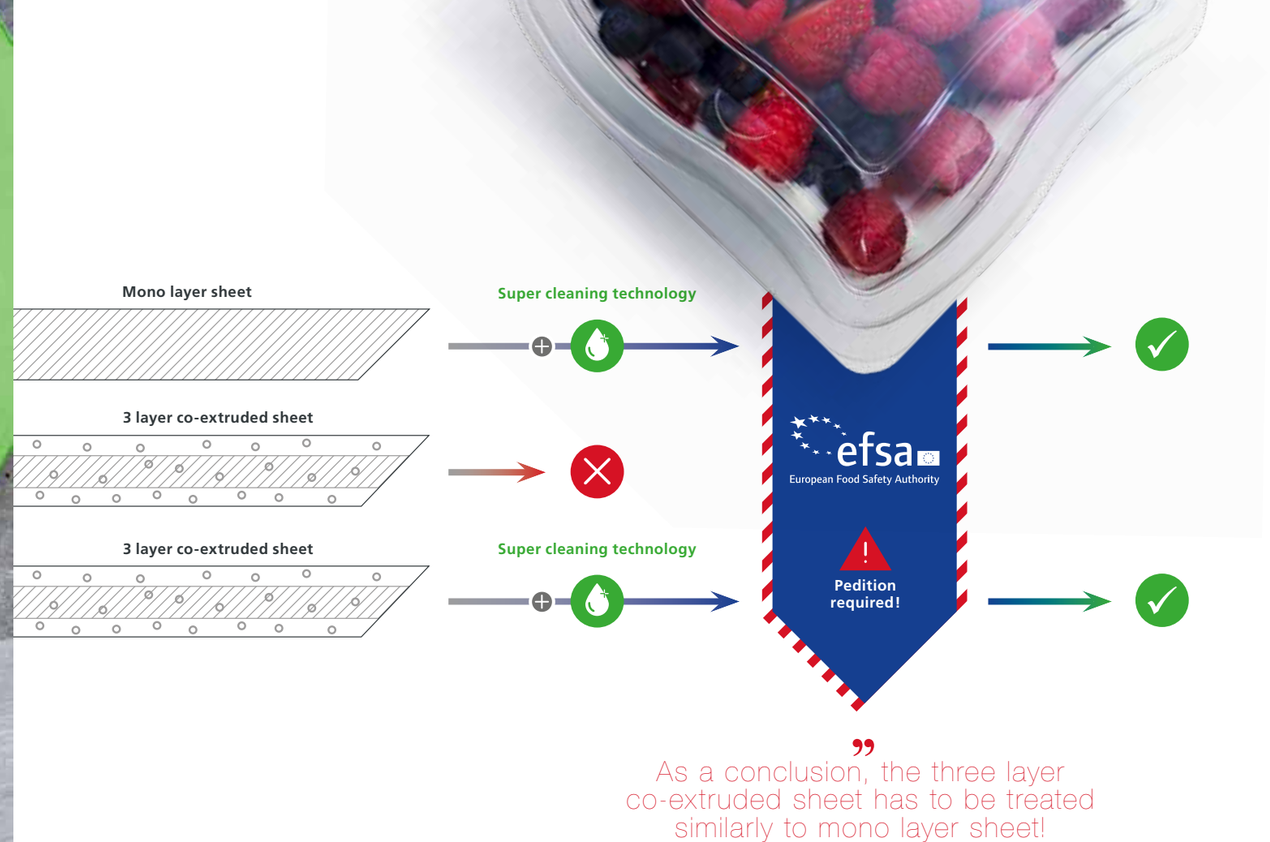
THE PROOF: CO-EXTRUDED PET SHEET IS NO FUNCTIONAL BARRIER



„As a conclusion, the three layer co-extruded sheet has to be treated similarly to mono layer sheet!“

A brand new study of Fraunhofer Institute for Process Engineering and Packaging (IVV), Freising Germany, shows very clearly that the co-extrusion of an outside virgin layer to a PET sheet is no functional barrier at all. Dr. Frank Welle from Fraunhofer explained during his speech on the occasion of the PET Recycling for Food Contact Conference in Frankfurt the possibilities for multilayer packaging in PET.

Both,
- SiOx coating and
- laminated virgin BOPET sheet

applied to a contaminated PET middle layer show functional barrier properties according to EU legislation.

For the test of the co-extruded ABA PET sheet, artificially contaminated material (challenge test material) was used in the middle layer of the sheet and different thicknesses of virgin outside layers had been co-extruded to the sheet in an industry production line under production conditions.

The results are showing a very clear picture:
The virgin layer is fully contaminated with the low to medium molecular weight substances and shows no lag time (the time the “barrier” can hold back substances from the contaminated middle layer). The virgin layer is contaminated at the same levels as the middle layer and therefore does not act as barrier.

When using rPET in the middle layer, co-extruded PET sheet has to be handled the same way as rPET for direct food contact, which means an EFSA petition has to be made.

The main contamination of the virgin layer happens in the feed block and extrusion die, where the 3 layers are married under melt temperatures of 260° C + for a time of approx. 10 seconds before the sheet gets cooled down on the chill rolls. Also the diffusion into the barrier during storage of the sheet roll, the reheating in the thermoforming process, the draw ratio in the thermoforming process, the thickness reduction of the virgin layer, and the storage time of the empty trays have to be taken into account before the time and conditions for contact with food can be applied to the package. There are no models for the diffusion taking place in the extrusion die.
The only proof for a co-extruded ABA sheet according to EU legislation, whether the virgin layer is a functional barrier or not is the challenge test, where artificially high contaminated material is used in the middle layer and the lag time in the final sheet for the different contaminants is measured. Also from legal point of view the only way to comply with EU regulations for producers of 3 layer co-extruded ABA sheet is the EFSA petition.

ASSESSMENT OF RECYCLATES BEHIND FUNCTIONAL BARRIERS

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