Source: JRC Technical guidelines for compliance testing in the framework of Regulation (EU) No 10/2011 on plastic food contact materials. Draft for stakeholder consultation. Eddo Hoekstra. 2015

Functional barrier properties of various polymers.
Required thickness of the layer (in µm) to act as a functional barrier for 4 different molecular mass ranges of substances, per polymer material in different time temperate conditions.

Polymer	time/Temp	FB layer thickness (µm)			
Molecular mass range of migrant (g/mol)		100-250	251-500	501-750	751-1500
LDPE, PP rubber	10 days at 60°C	no FB	no FB	7000	2600
	10 days at 40°C	no FB	8800	2640	1000
	10 days at 20°C	7000	3000	800	340
	2 hours at 100°C	no FB	10000	3240	1360
HDPE	10 days at 60°C	no FB	9000	3300	1080
	10 days at 40°C	8500	3000	960	400
	10 days at 20°C	2280	800	280	130
	2 hours at 100°C	no FB	6400	1800	700
PP homo/isotactic; random	10 days at 60°C	no FB	4600	1400	580
	10 days at 40°C	3900	1480	500	220
	10 days at 20°C	1080	440	160	70
	2 hours at 100°C	8000	3000	900	380
PET, PBT, PEN	10 days at 60°C	91	35	12	5
	10 days at 40°C	31	14	4	2
	10 days at 20°C	9	4	2	1
	2 hours at 100°C	61	23	7	3
PS	10 days at 60°C	127	49	16	6
	10 days at 40°C	46	18	6	3
	10 days at 20°C	17	7	3	1
	2 hours at 100°C	65	26	8	4
SBS	10 days at 60°C	no FB	no FB	4600	1900
	10 days at 40°C	no FB	5800	1750	700
	10 days at 20°C	5000	1900	600	280
	2 hours at 100°C	no FB	7600	3300	1000
PA 6	10 days at 60°C	210	82	25	10
	10 days at 40°C	80	32	11	5
	10 days at 20°C	26	11	4	2
	2 hours at 100°C	105	40	14	6

* In case of perfluorinated substances the maximum molecular mass should be 1500 g/mol due to the comparable lower molecular volume.

Regulation (EU) No 10/2011 on plastic food contact materials.
Annex V Compliance testing.
Chapter 2 Specific migration testing.
10 days at 60°C covers long term storage above 6 months at room temperature and below including heating up to 70°C for up to 2 hours, or heating up to 100 °C for up to 15 minutes.
10 days at 40°C covers all storage times at refrigerated and frozen conditions including heating up to 70°C for up to 2 hours, or heating up to 100°C for up to 15 minutes.
10 days at 20°C covers all storage times at frozen conditions.
Chapter 3 Testing for overall migration.
2 hours at 100 °C are standardised test conditions for high temperature applications up to 121 °C

Barrier films which act as a general Functional Barrier in reducing any migration down to levels below of 10 ppb at test conditions of 10d @ 60 °C.

Film structure	Base polymer	Barrier material
36 µm O-PET corona treated	PET	PET
12 µm PET metallised	PET	metallisation
12 µm PET-SiOx 80 nm *)	PET	SiOx
12 µm PET-SiOx 50 nm Ormocer-Laquer*)	PET	SiOx / Ormocer
12 µm PET / SiOx*)	PET	SiOx
12 µm PET / AlOx / adhesive / 30 µm PP	PP	PET-AlOx
6 µm aluminium)*		*Aluminium*
6 µm aluminium) / PE*	*PE*	*Aluminium*

*) It should be noted that this is only the case when no pinholes or other damages are present.

Barrier films which act as a Functional Barrier in reducing any migration down to levels below of 10 ppb when used for long term storage at room temperature.

Film structure	Base polymer	Barrier material
15 µm OPA*)	PA	PA
12 µm PET	PET	PET
12 µm PVDC coated transparent Polyester film	PET	PVDC
PE / EVOH 3 µm / PE total 30 µm	PE	EVOH

*) This efficiency is only ensured when no swelling occurs