

rPE Flex – target specification

rPE Flex is a L(L)DPE-rich recyclate from household post-consumer packaging waste that has been processed in a Quality Recycling Process (QRP). It is the drop (non-target) fraction of the additional sorting of DKR-310. QRP includes additional sorting, hot washing with detergents, extrusion with homogenization and degassing as well as double melt filtration and de-odourization.

This **target specification** is based on values, obtained during the extensive trial period on QRP under CEFLEX. All mentioned thresholds were met during these trials. Separate certificates of analysis (CoA) of materials resulting from these trials are available. These CoA contain some additional measurements, which have been omitted here because they are challenging to translate to objective target values (e.g. independent of sample sizes).

A **critical property for further development** of rPE Flex is:

- For blown film: the dart drop resistance, which is too low considered to C&I grades.
- For injection molding: MFI value, which is too low for high-throughput injection moulding and elastic modulus, which is either too high for real flexible applications or too low for high rigidity applications.

PROPERTY	UNIT	TYPICAL VALUE	COMMENTS	TEST METHOD
GENERAL				
Name	-	rPE Flex		
Composition	wt%	PE > 80, PP < 15, other < 7	Other= other than PE or PP	DSC-based (must be properly baselined)
APPEARANCE				
Shape	-	Granules		
PHYSICAL				
Melt Flow Index (MFI)	g/10 min	< 1 for film > 0.7 for injection	2.16 kg, 190 °C	ISO 1133
Density	g/cm ³	0.920-0.960		ISO 1183
Ash content	wt%	< 3	after 1h - 600°C	ASTM D5630
MECHANICAL – injection molded test bars*				
Modulus	tensile MPa	> 400	1 mm/min	ISO 527
Tensile strength	tensile MPa	> 15	50 mm/min	ISO 527
Strain at break	tensile %	> 250	50 mm/min	ISO 527
Impact strength (notched, 23°C)	kJ/m ²	> 35	Charpy	ISO 179
MECHANICAL – blown film* *				
Modulus	MD MPa	100-300	1 mm/min	ISO 527
Tensile strength	MD MPa	> 15	50 mm/min	ISO 527
Strain at break	MD %	> 400	50 mm/min	ISO 527
Dart drop resistance	g/μm	> 0.8		ASTM D1709
OTHER				
Bulk density	g/cm ³	> 0.50		EN 15344

* Injection moulded test bars type 1A for tensile testing. Nozzle temperature 220°C.

** Film blowing advised with single screw extruder, L/D min 20. BUR min 2.5, die temperature 220 °C. Thickness= 60-65 μm. Die cut samples type 5A for tensile test.

After prolonged storage or for the manufacture of sensitive products, drying of the material prior to processing and/or the use of moisture scavenger is recommended.