RecyClass Design for Recycling Guidelines

14 December 2022

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RecyClass

FOR BEGINNERS

WHAT ARE THE DESIGN FOR RECYCLING GUIDELINES?

GET IN TOUCH WITH US!

info@recyclass.eu

www.recyclass.eu

RecyClass | DESIGN FOR RECYCLING GUIDELINES

Recommendations on how to design plastic packaging

- Guidelines per packaging type
- Covers all the main packaging features
- Based on standardized scientific testing
- Updated regularly to stay in line with state-of-the-art processes

RecyClass

Natural HDPE Containers and Tubes

		YES - FULL COMPATIBILITY	CONDITIONAL - LIMITED COMPATIBILITY	NO - LOW COMPATIBILITY
	MATERIAL COMPOSITION (TOTAL AMOUNT OF **PE** & AMOUNT OF **PP ATTACHMENTS** IN THE PACKAGING)	A > 95%, B > 90% and all packaging features are FULLY compatible with recycling	C > 70% and all packaging features are FULLY compatible with recycling	D > 50%, E > 30%, F < 30% and all packaging features are FULLY compatible with recycling
	DESCRIPTION (TEST PROTOCOL)	Materials that passed the testing protocols with no negative impact OR materials that have not been tested (yet), but are known to be acceptable in PE recycling	Materials that passed the testing protocols if certain conditions are met OR materials that have not been tested (yet), but pose a low risk of interfering with PE recycling	Materials that failed the testing protocols OR materials that have not been tested (yet), but pose a high risk of interfering with PE recycling
	DESCRIPTION (METHODOLOGY)	In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from A to B or from B to C	In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from C to D	In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from D to E or from E to F
MAIN BODY	MATERIAL *	HDPE; Multilayer PE with HDPE prevalence (LLDPE, LDPE, MDPE)		Multilayers HDPE with PLA; PVC; PS; PET; PETG
MAIN BODY	COLOURS	Natural (clear)	Light colours	Black Inner layer; Black; Carbon Black; Other dark colours
MAIN BODY	SIZE		Items compacted < 5 cm	Items compacted < 2 cm
MAIN BODY	PRODUCT RESIDUES (EASY TO EMPTY INDEX)	A if the index is < 5%; B if the index is < 10%	C if the index is < 15%	D if the index is < 20%; E < if the index is 25%; F if the index is > 25%
MAIN BODY	BARRIER	EVOH < 6.0%wt + PE-g-MAH tie layers with MAH > 0.1%wt and EVOH:tie layers ratio < 2; Enkase (fluorination)	EVOH > 6.0%wt + PE-g-MAH tie layers with MAH > 0.1%wt and EVOH:tie layers ratio < 2; EVOH < 1% with any other tie layers	EVOH > 1% with any other tie layers; PA; PVDC; Plasma Fluorination; Aluminium
MAIN BODY	ADDITIVES	Additives that are unavoidable in processing (stabilizers, antioxidants, lubricants, nucleating agents, peroxides) and density remains < 0,97 g/cm³	Mineral fillers (CaCO3, talc) not increasing density more than 0,97 g/cm³	Additives changing the material density > 1 g/cm³; Flame-retardant additives, plasticizers; Bio-/oxo-/photodegradable additives
ATTACHMENTS	CLOSURE SYSTEM	HDPE; LDPE; LLDPE; MDPE	PP; PET; PETG; PLA; PS (all with a density > 1 g/cm³); Removable aluminium lidding	Non-PO and/or foams with density < 1 g/cm³; Aluminium; Metal; PVC
ATTACHMENTS	LINERS, SEALS AND VALVES	HDPE; LDPE; LLDPE; MDPE; TPO < 1wt%; TPS < 1wt%	PP; TPO > 1wt%; TPS > 1wt%; PET, PETG, PLA, PS (all with a density > 1 g/cm³); Removable silicon with a density > 1 g/cm³	Non-PO and/or foams with density < 1 g/cm³; Any other TPE; Aluminium; Metal; Foiled paper; PVC
ATTACHMENTS	OTHER COMPONENTS	HDPE, LDPE, LLDPE, MDPE	PP; PET; PETG; PLA; PS all with density > 1 g/cm³	Aluminium; PVC; Glass components; Foams with density < 1 g/cm³
ATTACHMENTS	COLOURS	Natural (clear)	Light colours	Black Inner layer, Black, Carbon Black, Other dark colours
DECORATION**	INKS	Non-bleeding inks compliant with EuPIA Exclusion Policy		Inks that bleed; Inks non-compliant with EuPIA Exclusion Policy; PVC binders
DECORATION**	LABELS MATERIALS (PSL, WET-GLUE LABELS, WRAP-AROUND LABELS, IML)	Labels in PE (all with density < 1 g/cm³)	Labels in PP, PO (with density < 1 g/cm³); Labels in PET, PETG, PLA, PS (all with density > 1 g/cm³); Labels in Paper without fibreloss; PO-foamed labels	Labels that hinder the recognition of the PE; Labels in non PO-materials with density < 1 g/cm³; Paper labels with fibreloss during recycling process; In-Mould-Labels; Aluminium; Metallised labels; PVC
DECORATION**	ADHESIVES FOR LABELS	Water soluble adhesive (@ less than 40°C); Water releasable adhesive (@ less than 40°C)		Non-water soluble adhesive (@ less than 40°C); Non-water releasable adhesive (@ less than 40°C)
DECORATION**	SLEEVES	Sleeves in PE (all with density < 1 g/cm³); Self-separable plastic and cardboard sleeves under mechanical pressure (sorting test mandatory)	Sleeves in PO (with density < 1 g/cm³); Sleeves in PET, PETG, PET-C, PLA, PS (all with density >1 g/cm³); Cardboard sleeves without fiberloss (sorting test mandatory)	Sleeves that hinder the recognition of the PE; Sleeves in non PO-materials with density < 1 g/cm³; Cardboard sleeves with fibreloss during recycling process; Aluminium; Metallised sleeves; Heavily inked sleeves; PVC
DECORATION**	DIRECT PRINTING	Laser marked; Production or best-before date		Any other direct printing
DECORATION**	OTHER DECORATIVE TECHNOLOGIES		Electroplating on attachments (with density > 1 g/cm³)	Electroplating on attachments (with density < 1 g/cm³)

RECYCLED CONTENT: No change in the recyclability assessment. A separate 'Recycled Plastics Traceability Certification' based on a Chain of Custody approach is available with RecyClass

* Polymer resin can be either fossil- or bio-based, virgin or recycled.

** Decorative technologies must not hinder the recognition of the underlaying PE-polymer. Features as size, print, mass colouration and/or barrier might require to perform a Sorting Evaluation Protocol. Known misleading features are listed on the RecyClass Methodology and the following size indications can be considered to ensure the recognition of PE:

- Size of non-PE detectable surfaces on containers > 500 ml: < 70% coverage
- Size of non-PE detectable surfaces on containers < 500 ml: < 50% coverage

Last update: September 2022

RecyClass | DESIGN FOR RECYCLING CONCEPT

RecyClass — **Natural HDPE Containers and Tubes**

	YES - FULL COMPATIBILITY	CONDITIONAL - LIMITED COMPATIBILITY	NO - LOW COMPATIBILITY
MATERIAL COMPOSITION (TOTAL AMOUNT OF **PE** & AMOUNT OF **PP ATTACHMENTS** IN THE PACKAGING)	A > 95%, B > 90% and all packaging features are FULLY compatible with recycling	C > 70% and all packaging features are FULLY compatible with recycling	D > 50%, E > 30%, F < 30% and all packaging features are FULLY compatible with recycling
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DESCRIPTION (METHODOLOGY)	In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from A to B or from B to C	In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from C to D	In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from D to E or from E to F
MAIN BODY: MATERIAL *			
MAIN BODY: COLOURS			
MAIN BODY: SIZE			
MAIN BODY: PRODUCT RESIDUES (EASY TO EMPTY INDEX)			
MAIN BODY: BARRIER			
MAIN BODY: ADDITIVES			
ATTACHMENTS: CLOSURE SYSTEM			
ATTACHMENTS: LINERS, SEALS AND VALVES			
ATTACHMENTS: OTHER COMPONENTS			
ATTACHMENTS: COLOURS			
DECORATION**: INKS			
DECORATION**: LABELS MATERIALS (PSL, WET-GLUE LABELS, WRAP-AROUND LABELS, IML)			
DECORATION**: ADHESIVES FOR LABELS			
DECORATION**: SLEEVES	Sleeves in PE (all with density < 1 g/cm³); Self-separable plastic and cardboard sleeves under mechanical pressure (sorting test mandatory)	Sleeves in PO (with density < 1 g/cm³); Sleeves in PET, PETG, PET-C, PLA, PS (all with density >1 g/cm³); Cardboard sleeves without fiberloss (sorting test mandatory)	Sleeves that hinder the recognition of the PE; Sleeves in non PO-materials with density < 1 g/cm³; Cardboard sleeves with fibreloss during recycling process; Aluminium; Metallised sleeves; Heavily inked sleeves; PVC
DECORATION**: DIRECT PRINTING			
DECORATION**: OTHER DECORATIVE TECHNOLOGIES			

FULL COMPATIBILITY

Green column gathers the preferred design features, that guarantee the best recyclability and quality of the recyclate.

LIMITED COMPATIBILITY

Yellow column lists the second choices for each packaging feature, that have been tested or are known to slightly impact the recycling process and/or the quality of the recyclate.

LOW COMPATIBILITY

Red column classifies the detrimental and disqualifying features that should be avoided when designing a packaging, as strongly impacting the recycling and/or the quality of the recyclate.

FACT BASED APPROACH

RecyClass | DESIGN FOR RECYCLING GUIDELINES

The guidelines cover the biggest plastic packaging recycling streams, readily available in Europe.

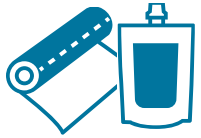
PET bottles (clear/light blue and coloured)

Clear PET trays

HDPE containers & tubes (coloured and transparent)

PP containers & tubes (coloured and transparent)

EPS fish boxes



PE films (coloured and natural)

PP films (coloured and natural)

PS coloured containers

Crates and Pallets

EPS white goods

RecyClass

FOR BEGINNERS

HOW ARE THE DESIGN FOR RECYCLING GUIDELINES DEVELOPED?

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RecyClass | GUIDELINES EVOLUTION

New elements added based on independent test campaigns

PE Coloured Flexible Films

YES - FULL COMPATIBILITY | CONDITIONAL - LIMITED COMPATIBILITY | NO - LOW COMPATIBILITY

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PE COLOURED FLEXIBLE FILMS for Household and Commercial Packaging

YES - FULL COMPATIBILITY | CONDITIONAL - LIMITED COMPATIBILITY | NO - LOW COMPATIBILITY

RecyClass

PE COLOURED FLEXIBLE FILMS for Household and Commercial Packaging

RecyClass

Coloured PE Flexible Films for Household and Commercial Packaging

		YES - FULL COMPATIBILITY	CONDITIONAL - LIMITED COMPATIBILITY	NO - LOW COMPATIBILITY
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DESCRIPTION (METHODOLOGY)		In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from A to B or from B to C	In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from C to D	In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from D to E or from E to F
MAIN BODY	MATERIAL	PE-LD, PE-LLD; PE-HD	Multilayer PE/PP with PP < 5%	Multilayer PE/PP with PP > 5%; Any other polymer (e.g. PET, PVC, etc.)
	COLOURS	Light colours; translucent colours	NIR-detectable dark colours (Sorting test)	Non NIR-detectable dark colours
	SIZE	> A4 or > 50 x 50 mm once compacted	< A4 format or between 20 x 20 and 50 x 50 mm once compacted (Sorting test)	< 20 x 20 mm
	PRODUCT RESIDUES (EASY TO EMPTY INDEX)	A if the index is < 5%; B if the index is < 10%	C if the index is < 15%	D if the index is < 20%; E < if the index is < 25%; F if the index is > 25%
	BARRIER	Barrier in the polymer matrix; SiOx and AlOx without additional coatings	< 5% EVOH (in polyolefinic combination film); metallized layers without coatings; EcoLam High Plus; VO+ LLDPE; <15% PA 6/66 copolymer with melting temperature < 192 °C and incorporating > 10% PE-g-MAH tie layers	> 5% EVOH (in polyolefinic combination film); Any other PA; barrier layer PVC, PVDC; any other barrier layer; foaming agents used as expanding chemical agents; aluminium
	ADDITIVES	Additives that do not increase the density higher than 0,97 g/cm³		Bio-/oxo-/photodegradable additives Additives that do increase the density higher than 0,97 g/cm³ (CaCO3, talc, glass fibers, etc.)
ATTACHMENTS	CLOSURE SYSTEM	PE-LD, PE-LLD, PE-HD	PP	Metal, aluminium, PVC, PET, PETG, PS, PLA, non PO or foams with density < 1 g/cm³
	LINERS, SEALS AND VALVES	PE-LD, PE-LLD, PE-HD	PP, removable aluminium lidding	Metal, aluminium, PVC, PET, PETG, PS, PLA, foiled paper, non PO or foams with density < 1 g/cm³
	OTHER COMPONENTS	PE-LD, PE-LLD, PE-HD	PP	Metal, aluminium, PVC, PET, PETG, PS, PLA, paper, foams with density < 1 g/cm³
DECORATION	INKS	Non-bleeding inks compliant with EuPIA Exclusion Policy		Inks that bleed; Inks non-compliant with EuPIA Exclusion Policy
	LABELS	PE	PP, paper labels without fiberloss	Metallized labels, any other; paper labels with fibreloss
	ADHESIVES FOR LABELS	Water soluble or water-releasable at less than 60°C		Adhesives non-soluble in water or non-releasable in water at less than 60°C
	DIRECT PRINTING	Laser marked print; Printed production or expiry date; printing covering < 50%**	Printing covering > 50% **	

RECYCLED CONTENT: No change in the recyclability assessment. A separate 'Recycled Plastics Traceability Certification' based on a Chain of Custody approach is available with RecyClass

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** Temporary solution

Last update: June 2021

RecyClass | WHO IS DEVELOPING THE GUIDELINES?

BRANDS & RETAILERS

P&G, Danone, Unilever, ISDIN, ALDI, Lavazza, L'Oréal, Mondelēz International, Avon, essity, PepsiCo, Colgate-Palmolive, Kao, Henkel, Ferrero, Orkla, Schwarz (Lidl, Kaufland), Edgewell Personal Care, Reckitt, Haleon, Schwarz Produktion, preZero

CONVERTERS

Constantia Flexibles, Berry, Sealed Air, amcor, greiner packaging, Neopac The Tube, Milliken, Taghleef Industries, Aptargroup, Lumson Cosmetic Packaging Industries, Albéa packaging and more, Huhtamaki, Silgan Dispensing, DI MAURO flexible packaging, 深圳市通产丽星科技集团有限公司 Shenzhen Beauty Star Co., Ltd, Hueck Folien, IPV Pack, Gualapack, Fuji Seal, Imperial Polythene, epl Leading the Pack, Trioworld, ATE ΠΛΑΣΤ, Guala dispensing a Guala Group company, BEWI for a better everyday, SACMI Endless Innovation Since 1919, ZOTEFOAMS

RAW MATERIAL PRODUCERS

Bostik smart adhesives, UPM Raflatac, UPM, coim, Avery Dennison, aquapak, KURZ, SunChemical a member of the DIC group, CTC Color & Comfort, Borealis Keep Discovering, Siegwerk, ExxonMobil, kuraray, All4Labels Global Packaging Group, MCC Multi-Color Premium Label Solutions, YUPO, UBE, Dow, CCL, Fedrigoni Self-Adhesives, TRINSEO, MORCHEM Your Innovation Partner, TOPAS Advanced Polymers, Mitsubishi Chemical, heubach, saes coated films Advanced coatings for sustainable solutions, KRATON, BASF We create chemistry, AVIENT

SUPPORTERS

epro European Association Of Plastics Recycling & Recovery Organisations, petcore Europe Pioneering PET circularity since 1994, Polski Pakt Plastikowy, Grønt Punkt Norge, fti Förpackningsinsamlingen, FEICA, EuPIA, Svensk Plastatervinning, Styrenics Circular Solutions, AGMPM, ANARPLA, FINAT Linking the Label Community, EUMEPS, LINPRA, natureef, NTCP national test centre circular plastics, Searious BUSINESS, HPRC Healthcare Plastics Recycling Council

RecyClass | GUIDELINES UPDATE

RecyClass — **Coloured PE Flexible Films for Household and Commercial Packaging**

		YES - FULL COMPATIBILITY	CONDITIONAL - LIMITED COMPATIBILITY	NO - LOW COMPATIBILITY
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MAIN BODY	MATERIAL	PE-LD, PE-LLD; PE-HD	Multilayer PE/PP with PP < 5%	Multilayer PE/PP with PP > 5%; Any other polymer (e.g. PET, PVC, etc.)
MAIN BODY	COLOURS	L colours; translucent colours	NIR-detectable dark colours (Sorting test)	Non NIR-detectable dark colours
MAIN BODY	SIZE	or > 50 x 50 mm once compacted	< A4 format or between 20 x 20 and 50 x 50 mm once compacted (Sorting test)	< 20 x 20 mm
MAIN BODY	PRODUCT RESIDUES (EASY TO EMPTY INDEX)	A if the index is < 5%; B if the index is < 10%	C if the index is < 15%	D if the index is < 20%; E < if the index is < 25%; F if the index is > 25%
MAIN BODY	BARRIER	r in the polymer matrix; and AlOx without additional coatings	< 5% EVOH (in polyolefinic combination film); metallized layers without coatings; EcoLam High Plus; VO< LLDPE; <15% PA 6/66 copolymer with melting temperature < 192 °C and incorporating > 10% PE-g-MAH tie layers	> 5% EVOH (in polyolefinic combination film); Any other PA; barrier layer PVC, PVDC; any other barrier layer; foaming agents used as expanding chemical agents; aluminium
MAIN BODY	ADDITIVES	ives that do not increase the density higher than 0,97 g/cm³		Bio-/oxo-/photodegradable additives Additives that do increase the density higher than 0,97 g/cm³ (CaCO3, talc, glass fibers, etc.)
ATTACHMENTS	CLOSURE SYSTEM	PE-LD, PE-LLD, PE-HD	PP	Metal, aluminium, PVC, PET, PETG, PS, PLA, non PO or foams with density < 1 g/cm³
ATTACHMENTS	LINERS, SEALS AND VALVES	PE-LD, PE-LLD, PE-HD	PP, removable aluminium lidding	Metal, aluminium, PVC, PET, PETG, PS, PLA, foiled paper, non PO or foams with density < 1 g/cm³
ATTACHMENTS	OTHER COMPONENTS	PE-LD, PE-LLD, PE-HD	PP	Metal, aluminium, PVC, PET, PETG, PS, PLA, paper, foams with density < 1 g/cm³
DECORATION	INKS	N bleeding inks compliant with EuPIA Exclusion Policy		Inks that bleed; Inks non-compliant with EuPIA Exclusion Policy
DECORATION	LABELS	PE	PP, paper labels without fiberloss	Metallized labels, any other; paper labels with fibreloss
DECORATION	ADHESIVES FOR LABELS	r soluble or water-releasable at less than 60°C		Adhesives non-soluble in water or non-releasable in water at less than 60°C
DECORATION	DIRECT PRINTING	L r marked print; ed production or expiry date; printing covering < 50%**	Printing covering > 50% **	

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** Temporary solution

Last update: June 2021

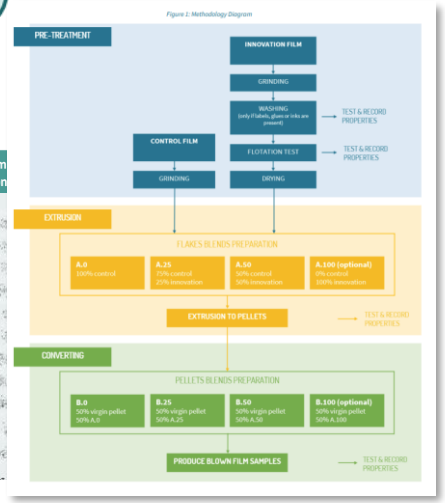
1

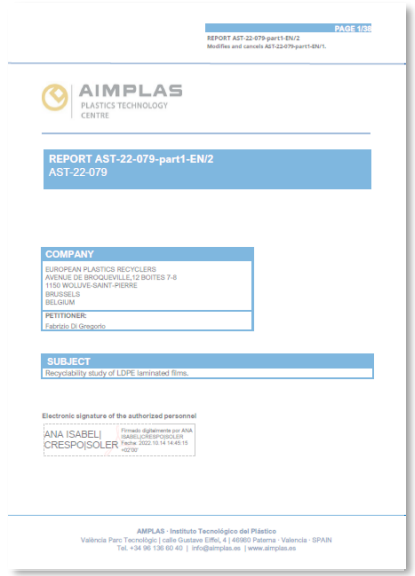
Ex: No information on **laminating adhesives**

RecyClass TC defines the scope of the **test campaign**

2

#	Solvent	Isocyanate type	Polyol type	NCO/OH termination	NCO:OH ratio	Free-m




PAGE 1/2

REPORT AST-22-079-part1-EN/2
Modifies and cancels AST-22-079-part1-EN/1.

AIMPLAS
PLASTICS TECHNOLOGY CENTRE

REPORT AST-22-079-part1-EN/2
AST-22-079

COMPANY
EUROPEAN PLASTICS RECYCLERS
AVENUE DE BROQUEVILLE,12 BOITES 7-8
1150 WOLUVE-SAINT-PIERRE
BRUSSELS
BELGIUM

PETITIONER
Fabrizio Di Gregorio

SUBJECT
Recyclability study of LDPE laminated films.

Electronic signature of the authorized personnel
ANA ISABELI CRESPO|SOLER

AMPLAS - Instituto Tecnológico del Plástico
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3

Laboratory results reviewed within RecyClass TC

4

DfR Guidelines updated with findings of the test campaign

RecyClass — **Coloured PE Flexible Films for Household and Commercial Packaging**

		YES - FULL COMPATIBILITY	CONDITIONAL - LIMITED COMPATIBILITY	NO - LOW COMPATIBILITY
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MAIN BODY	ADDITIVES	Additives that do not increase the density higher than 0,97 g/cm³		Bio-/oxo-/photodegradable additives Additives that do increase the density higher than 0,97 g/cm³ (CaCO3, talc, glass fibers, etc.)
ATTACHMENTS	CLOSURE SYSTEM	PE-LD, PE-LLD, PE-HD	PP	Metal, aluminium, PVC, PET, PETG, PS, PLA, non PO or foams with density < 1 g/cm³
ATTACHMENTS	LINERS, SEALS AND VALVES	PE-LD, PE-LLD, PE-HD	PP, removable aluminium lidding	Metal, aluminium, PVC, PET, PETG, PS, PLA, foiled paper, non PO or foams with density < 1 g/cm³
ATTACHMENTS	OTHER COMPONENTS	PE-LD, PE-LLD, PE-HD	PP	Metal, aluminium, PVC, PET, PETG, PS, PLA, paper, foams with density < 1 g/cm³
DECORATION	INKS	Non-bleeding inks compliant with EuPIA Exclusion Policy		Inks that bleed; Inks non-compliant with EuPIA Exclusion Policy
DECORATION	LABELS	PE	PP, paper labels without fiberloss	Metallized labels, any other; paper labels with fibreloss
DECORATION	ADHESIVES FOR LABELS	Water soluble or water-releasable at less than 60°C		Adhesives non-soluble in water or non-releasable in water at less than 60°C
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RecyClass

NEW FINDINGS ARE USED TO UPDATE THE GUIDELINES

APPROVED

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		YES - FULL COMPATIBILITY	CONDITIONAL - LIMITED COMPATIBILITY	NO - LOW COMPATIBILITY
	MATERIAL COMPOSITION (AMOUNT OF PE & PP ATTACHMENTS IN THE PACKAGING)	A > 95%, B > 90% and all packaging features are FULLY compatible with recycling	C > 70% and all packaging features are FULLY compatible with recycling	D > 50%, E > 30%, F < 30% and all packaging features are FULLY compatible with recycling
	DESCRIPTION (TEST PROTOCOL)	Materials that passed the testing protocols with no negative impact OR materials that have not been tested (yet), but are known to be acceptable in PE recycling	Materials that passed the testing protocols if certain conditions are met OR materials that have not been tested (yet), but pose a low risk of interfering with PE recycling	Materials that failed the testing protocols OR materials that have not been tested (yet), but pose a high risk of interfering with PE recycling
	DESCRIPTION (METHODOLOGY)	In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from A to B or from B to C	In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from C to D	In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from D to E or from E to F
MAIN BODY	MATERIAL *	HDPE; Multilayer PE with HDPE prevalence (LLDPE, LDPE, MDPE)		Multilayers HDPE with PLA; PVC; PS; PET; PETG
MAIN BODY	COLOURS	All colours	Black inner layer and dark colours (NIR-detectable)	Non NIR-detectable colours
MAIN BODY	SIZE		Items compacted < 5 cm	Items compacted < 2 cm
MAIN BODY	PRODUCT RESIDUES (EASY TO EMPTY INDEX)	A if the index is < 5%; B if the index is < 10%	C if the index is < 15%	D if the index is < 20%; E < if the index is 25%; F if the index is > 25%
MAIN BODY	BARRIER	EVOH < 6.0%wt + PE-g-MAH tie layers with MAH > 0.1%wt and EVOH:tie layers ratio < 2; Enkase (fluorination)	EVOH > 6.0%wt + PE-g-MAH tie layers with MAH > 0.1%wt and EVOH:tie layers ratio < 2; EVOH < 1% with any other tie layers	EVOH > 1% with any other tie layers; PA; PVDC; Aluminium
MAIN BODY	ADDITIVES	Additives that are unavoidable in processing (stabilizers, antioxidants, lubricants, nucleating agents, peroxides) and density remains < 0,97 g/cm³	Mineral fillers (CaCO3, talc) not increasing density more than 0,97 g/cm³	Additives changing the material density > 1 g/cm³; Flame-retardant additives, plasticizers; Bio-/oxo-/photodegradable additives
ATTACHMENTS	CLOSURE SYSTEM	HDPE; LDPE; LLDPE; MDPE	PP; PET; PETG; PLA; PS (all with a density > 1 g/cm³); Removable aluminium lidding	Non-PO and/or foams with density < 1 g/cm³; Aluminium; Metal; PVC
ATTACHMENTS	LINERS, SEALS AND VALVES	HDPE; LDPE; LLDPE; MDPE; TPE-PE	PP; TPE-PP; PET, PETG, PLA, PS (all with a density > 1 g/cm³); Removable silicon with a density > 1 g/cm³	Non-PO and/or foams with density < 1 g/cm³; Any other TPE; Aluminium; Metal; Foiled paper; PVC
ATTACHMENTS	OTHER COMPONENTS	HDPE, LDPE, LLDPE, MDPE	PP; PET; PETG; PLA; PS all with density > 1 g/cm³	Aluminium; PVC; Glass components; Foams with density < 1 g/cm³
DECORATION**	INKS	Non toxic following the EuPIA Guidelines		Inks that bleed; Toxic or hazardous inks; PVC binders
DECORATION**	LABELS MATERIALS (PSL, WET-GLUE LABELS, WRAP-AROUND LABELS, IML)	Labels in PE (all with density < 1 g/cm³); In-Mould-Labels in PE printed with < 1 wt% of the total packaging (except dark colours and bleeding inks)	Labels in PP, PO (with deneity < 1 g/cm³); Labels in PET, PETG, PLA, PS (all with density > 1 g/cm³); Labels in Paper without fibreloss; PO-foamed labels; Any other In-Mould-Labels in PE (except bleeding inks)	Labels that hinder the recognition of the PE; Labels in non PO-materials with density < 1 g/cm³; Paper labels with fibreloss during recycling process; Cardboard or paper In-Mould-Labels; Aluminium; Metallised labels; PVC
DECORATION**	ADHESIVES FOR LABELS	Water soluble adhesive (@ less than 40°C); Water releasable adhesive (@ less than 40°C)	Non-water soluble or non-releasable adhesive approved by RecyClass in combination with filmic PO labels	Non-water soluble adhesive (@ less than 40°C); Non-water releasable adhesive (@ less than 40°C)
DECORATION**	SLEEVES	Sleeves in PE (all with density < 1 g/cm³); Self-separable plastic and cardboard sleeves under mechanical pressure (sorting test mandatory)	Sleeves in PO (with density < 1 g/cm³); Sleeves in PET, PETG, PET-C, PLA, PS (all with density >1 g/cm³); Cardboard sleeves without fiberloss (sorting test mandatory)	Sleeves that hinder the recognition of the PE; Sleeves in non PO-materials with density < 1 g/cm³; Cardboard sleeves with fibreloss during recycling process; Aluminium; Metallised sleeves; Heavily inked sleeves; PVC
DECORATION**	DIRECT PRINTING	Laser marked; Production or best-before date; Direct printing (inks + lacquer) representing < 1 wt% of the total packaging (except dark colours)	Any other direct printing; Cold transfer and hot stamping technologies that does not hinder the recognition of the underlaying PE-polymer	
DECORATION**	OTHER DECORATIVE TECHNOLOGIES		Electroplating on attachments (with density > 1 g/cm³)	Electroplating on attachments (with density < 1 g/cm³)

RECYCLED CONTENT: No change in the recyclability assessment. A separate 'Recycled Plastics Traceability Certification' based on a Chain of Custody approach is available with RecyClass

* Polymer resin can be either fossil- or bio-based, virgin or recycled.
** Decorative technologies must not hinder the recognition of the underlaying PE-polymer. Features as size, print, mass colouration and/or barrier might require to perform a Sorting Evaluation Protocol. Known misleading features are listed on the RecyClass Methodology and the following size indications can be considered to ensure the recognition of PE:
- Size of non-PE detectable surfaces on containers > 500 ml: < 70% coverage
- Size of non-PE detectable surfaces on containers < 500 ml: < 50% coverage

Last update: Dec. 2021

Overview of tested technologies

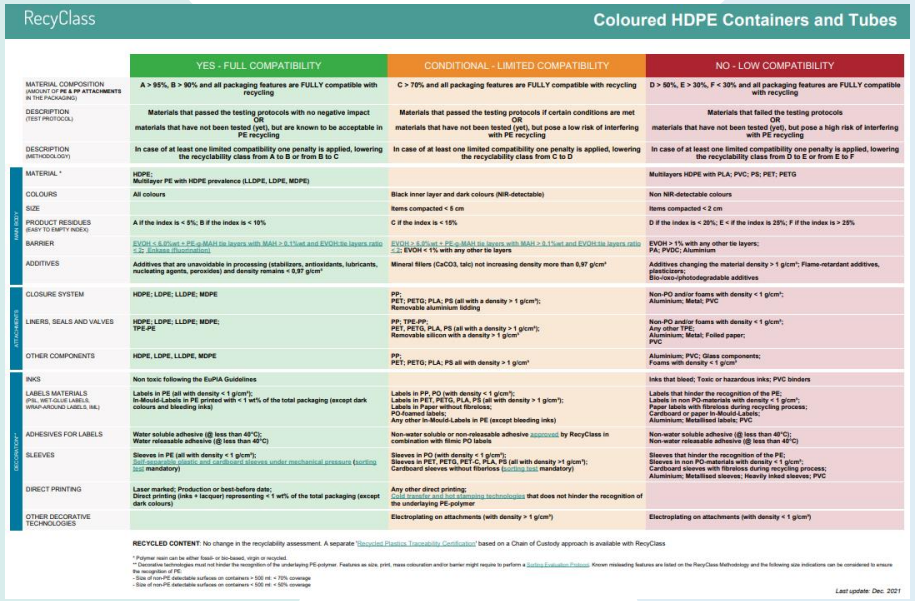
RecyClass | FROM INNOVATION TO CERTIFICATION

Innovative Technology

RECYCLABILITY APPROVAL PROCESS

Lab Testing

Approval Letter



RecyClass — Coloured HDPE Containers and Tubes

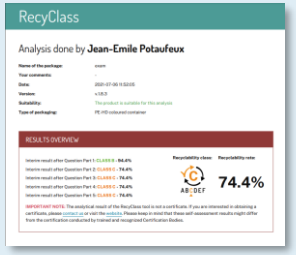
	YES - FULL COMPATIBILITY	CONDITIONAL - LIMITED COMPATIBILITY	NO - LOW COMPATIBILITY
MATERIAL COMPOSITION (AMOUNT OF PE & PP ATTACHMENTS IN THE PACKAGING)	A > 95%, B > 90% and all packaging features are FULLY compatible with recycling	C > 70% and all packaging features are FULLY compatible with recycling	D > 50%, E > 30%, F < 30% and all packaging features are FULLY compatible with recycling
DESCRIPTION (TEST PROTOCOL)	Materials that passed the testing protocols with no negative impact OR materials that have not been tested (yet), but are known to be acceptable in PE recycling	Materials that passed the testing protocols if certain conditions are met OR materials that have not been tested (yet), but pose a low risk of interfering with PE recycling	Materials that failed the testing protocols OR materials that have not been tested (yet), but pose a high risk of interfering with PE recycling
DESCRIPTION (METHODOLOGY)	In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from A to B or from B to C	In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from C to D	In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from D to E or from E to F
MATERIAL *	HDPE; Multilayer PE with HDPE prevalence (LLDPE, LDPE, MDPE)		Multilayers HDPE with PLA; PVC; PS; PET; PETG
COLOURS	All colours	Black inner layer and dark colours (NIR-detectable)	Non NIR-detectable colours
SIZE		Items compacted < 6 cm	Items compacted < 2 cm
PRODUCT RESIDUES (EASY TO EMPTY INDEX)	A if the index is < 5%; B if the index is < 10%	C if the index is < 15%	D if the index is < 25%; E < if the index is 25%; F if the index is > 25%
BARRIER	EVOH < 6.0%wt + PE-g-MAH tie layers with MAH > 0.1%wt and EVOH:tie layers ratio < 2; Ethylex (fluorination)	EVOH < 6.0%wt + PE-g-MAH tie layers with MAH > 0.1%wt and EVOH:tie layers ratio < 2; EVOH < 1% with any other tie layers	EVOH > 1% with any other tie layers; PA; PVDC; Aluminium
ADDITIVES	Additives that are unavoidable in processing (stabilizers, antioxidants, lubricants, nucleating agents, peroxides) and density remains < 0,97 g/cm³	Mineral fillers (CaCO3, talc) not increasing density more than 0,97 g/cm³	Additives changing the material density > 1 g/cm³; Flame-retardant additives, plasticizers; Bio-/oxo-/photodegradable additives
CLOSURE SYSTEM	HDPE; LDPE; LLDPE; MDPE	PP; PET; PETG; PLA; PS (all with a density > 1 g/cm³); Removable aluminium lidding	Non-PO and/or foams with density < 1 g/cm³; Aluminium; Metal; PVC
LINERS, SEALS AND VALVES	HDPE; LDPE; LLDPE; MDPE; TPE-PE	PP; TPE-PP; PET, PETG, PLA, PS (all with a density > 1 g/cm³); Removable silicon with a density > 1 g/cm³	Non-PO and/or foams with density < 1 g/cm³; Any other TPE; Aluminium; Metal; Foiled paper; PVC
OTHER COMPONENTS	HDPE, LDPE, LLDPE, MDPE	PP; PET; PETG; PLA; PS all with density > 1 g/cm³	Aluminium; PVC; Glass components; Foams with density < 1 g/cm³
INKS	Non toxic following the EuPIA Guidelines		Inks that bleed; Toxic or hazardous inks; PVC binders
LABELS MATERIALS (PSL, WET-GLUE LABELS, WRAP-AROUND LABELS, IML)	Labels in PE (all with density < 1 g/cm³); In-Mould-Labels in PE printed with < 1 wt% of the total packaging (except dark colours and bleeding inks)	Labels in PP, PO (with density < 1 g/cm³); Labels in PET, PETG, PLA, PS (all with density > 1 g/cm³); Labels in Paper without fibreloss; PO-foamed labels; Any other In-Mould-Labels in PE (except bleeding inks)	Labels that hinder the recognition of the PE; Labels in non PO-materials with density < 1 g/cm³; Paper labels with fibreloss during recycling process; Cardboard or paper In-Mould-Labels; Aluminium; Metallised labels; PVC
ADHESIVES FOR LABELS	Water soluble adhesive (@ less than 40°C); Water releasable adhesive (@ less than 40°C)	Non-water soluble or non-releasable adhesive approved by RecyClass in combination with filmic PO labels	Non-water soluble adhesive (@ less than 40°C); Non-water releasable adhesive (@ less than 40°C)
SLEEVES	Sleeves in PE (all with density < 1 g/cm³); Self-separating plastic and cardboard sleeves under mechanical pressure (sorting test mandatory)	Sleeves in PO (with density < 1 g/cm³); Sleeves in PET, PETG, PET-C, PLA, PS (all with density >1 g/cm³); Cardboard sleeves without fibreloss (sorting test mandatory)	Sleeves that hinder the recognition of the PE; Sleeves in non PO-materials with density < 1 g/cm³; Cardboard sleeves with fibreloss during recycling process; Aluminium; Metallised sleeves; Heavily inked sleeves; PVC
DIRECT PRINTING	Laser marked; Production or best-before date; Direct printing (inks + lacquer) representing < 1 wt% of the total packaging (except dark colours)	Any other direct printing; Cold transfer and hot stamping technologies that does not hinder the recognition of the underlying PE-polymer	
OTHER DECORATIVE TECHNOLOGIES		Electroplating on attachments (with density > 1 g/cm³)	Electroplating on attachments (with density < 1 g/cm³)

RECYCLED CONTENT: No change in the recyclability assessment. A separate 'Recycled Plastics Traceability Certification' based on a Chain of Custody approach is available with RecyClass

* Polymer resin can be either fossil- or bio-based, virgin or recycled.
** Decorative technologies must not hinder the recognition of the underlying PE-polymer. Features as size, print, mass colouration and/or barrier might require to perform a Sorting Evaluation Protocol. Known misleading features are listed on the RecyClass Methodology and the following size indications can be considered to ensure the recognition of PE:
- Size of non-PE detectable surfaces on containers > 500 ml: < 70% coverage
- Size of non-PE detectable surfaces on containers < 500 ml: < 50% coverage

Last update: Dec. 2021

Self-Assessment (Online Tool)



CERTIFICATION PROCESS

CB Audit

Certification

RecyClass

THE IMPORTANCE OF HARMONISED & SCIENTIFIC-BASED INFORMATION

- ✓ Strengthens and gives **credibility** to the message;
- ✓ Provides for **effective communication** with stakeholders;
- ✓ Provides **clear direction** for design for recyclability policies within brands.

RecyClass

FOR BEGINNERS

HOW TO USE THE DESIGN FOR RECYCLING GUIDELINES?

GET IN TOUCH WITH US!

info@recyclass.eu

www.recyclass.eu

RECYCLASS METHODOLOGY

1 EXISTING RECYCLING STREAMS & SORTABILITY

2 RECYCLABLE PLASTIC CONTENT

3 DESIGN INCOMPATIBILITIES (**DfR Guidelines**)

4 EASY-TO-EMPTY / EASY-TO-ACCESS INDEX

5 REACH COMPLIANCE

Check the Methodology online!

RECYCLABILITY CLASSES

CLASS A
The packaging does not pose any recyclability issues and the recycled plastics can potentially feed a closed-loop scheme to be used in the same quality application.

CLASS B
The packaging has some minor recyclability issues that slightly affect the quality of the recycled plastic generated. However, majority of recycled plastics from this packaging can still potentially feed a closed loop.

CLASS C
The packaging presents some recyclability issues that affect the quality of the recycled plastics or lead to material losses during recycling. In the first case the recycled plastic could be used in a cascade open-loop scheme, whereas in the latter case the plastic could potentially feed a closed loop scheme.

CLASS D
The packaging has significant design issues that highly affect its recyclability or imply large material losses. In both cases the recycled plastic can only be fed into low-value applications (i.e. the packaging will be downcycled).

CLASS E
The packaging has major design issues that jeopardize its recyclability or imply severe material losses. The packaging is not considered recyclable and can only be used in incineration with energy recovery.

CLASS F
The package is not recyclable at all, either because of fundamental design issues or a lack of specific infrastructure for collection, sorting and recycling in EU28+2.

RecyClass | DfR GUIDELINES

RecyClass

1 Coloured HDPE Containers and Tubes

		YES - FULL COMPATIBILITY (2)	CONDITIONAL - LIMITED COMPATIBILITY	NO - LOW COMPATIBILITY
	MATERIAL COMPOSITION (TOTAL AMOUNT OF PE & AMOUNT OF PP ATTACHMENTS IN THE PACKAGING)	A > 95%, B > 90% and all packaging features are FULLY compatible with recycling	C > 70% and all packaging features are FULLY compatible with recycling	D > 50%, E > 30%, F < 30% and all packaging features are FULLY compatible with recycling
	DESCRIPTION (TEST PROTOCOL)	Materials that passed the testing protocols with no negative impact OR materials that have not been tested (yet), but are known to be acceptable in PE recycling	Materials that passed the testing protocols if certain conditions are met OR materials that have not been tested (yet), but pose a low risk of interfering with PE recycling	Materials that failed the testing protocols OR materials that have not been tested (yet), but pose a high risk of interfering with PE recycling
	DESCRIPTION (METHODOLOGY)	In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from A to B or from B to C	In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from C to D	In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from D to E or from E to F
MAIN BODY	MATERIAL *	HDPE; Multilayer PE with HDPE prevalence (LLDPE, LDPE, MDPE)		Multilayers HDPE with PLA; PVC; PS; PET; PETG
MAIN BODY	COLOURS	All colours	Black inner layer and dark colours (NIR-detectable)	Non NIR-detectable colours
MAIN BODY	SIZE		Items compacted < 5 cm	Items compacted < 2 cm
MAIN BODY	PRODUCT RESIDUES (EASY TO EMPTY INDEX)	A if the index is < 5%; B if the index is < 10%	C if the index is < 15%	D if the index is < 20%; E < if the index is 25%; F if the index is > 25%
MAIN BODY	BARRIER	EVOH < 6.0%wt + PE-g-MAH tie layers with MAH > 0.1%wt and EVOH:tie layers ratio < 2; Enkase (fluorination)	EVOH > 6.0%wt + PE-g-MAH tie layers with MAH > 0.1%wt and EVOH:tie layers ratio < 2; EVOH < 1% with any other tie layers; Plasma Fluorination	EVOH > 1% with any other tie layers; PA; PVDC; Aluminium
MAIN BODY	ADDITIVES	Additives that are unavoidable in processing (stabilizers, antioxidants, lubricants, nucleating agents, peroxides) and density remains < 0,97 g/cm³	Mineral fillers (CaCO3, talc) not increasing density more than 0,97 g/cm³	Additives changing the material density > 1 g/cm³; Flame-retardant additives, plasticizers; Bio-/oxo-/photodegradable additives
ATTACHMENTS (3)	CLOSURE SYSTEM	HDPE; LDPE; LLDPE; MDPE	PP; PET; PETG; PLA; PS (all with a density > 1 g/cm³); Removable aluminium lidding	Non-PO and/or foams with density < 1 g/cm³; Aluminium; Metal; PVC
ATTACHMENTS (3)	LINERS, SEALS AND VALVES	HDPE; LDPE; LLDPE; MDPE; TPO < 1wt%; TPS < 1wt%	PP; TPO > 1wt%; TPS > 1wt%; PET, PETG, PLA, PS (all with a density > 1 g/cm³); Removable silicon with a density > 1 g/cm³	Non-PO and/or foams with density < 1 g/cm³; Any other TPE; Aluminium; Metal; Foiled paper; PVC
ATTACHMENTS (3)	OTHER COMPONENTS	HDPE, LDPE, LLDPE, MDPE	PP; PET; PETG; PLA; PS all with density > 1 g/cm³	Aluminium; PVC; Glass components; Foams with density < 1 g/cm³
DECORATION**	INKS	Non-bleeding inks compliant with EuPIA Exclusion Policy		Inks that bleed; Inks non-compliant with EuPIA Exclusion Policy; PVC binders
DECORATION**	LABELS MATERIALS (PSL, WET-GLUE LABELS, WRAP-AROUND LABELS, IML)	Labels in PE (all with density < 1 g/cm³); In-Mould-Labels in PE printed with < 1 wt% of the total packaging (except dark colours and bleeding inks)	Labels in PP, PO (with density < 1 g/cm³); Labels in PET, PETG, PLA, PS (all with density > 1 g/cm³); Labels in Paper without fibreloss; PO-foamed labels; Any other In-Mould-Labels in PE (except bleeding inks)	Labels that hinder the recognition of the PE; Labels in non PO-materials with density < 1 g/cm³; Paper labels with fibreloss during recycling process; Cardboard or paper In-Mould-Labels; Aluminium; Metallised labels; PVC
DECORATION**	ADHESIVES FOR LABELS	Water soluble adhesive (@ less than 40°C); Water releasable adhesive (@ less than 40°C)	Non-water soluble or non-releasable adhesive approved by RecyClass in combination with filmic PO labels	Non-water soluble adhesive (@ less than 40°C); Non-water releasable adhesive (@ less than 40°C)
DECORATION**	SLEEVES	Sleeves in PE (all with density < 1 g/cm³); Self-separable plastic and cardboard sleeves under mechanical pressure (sorting test mandatory)	Sleeves in PO (with density < 1 g/cm³); Sleeves in PET, PETG, PET-C, PLA, PS (all with density >1 g/cm³); Cardboard sleeves without fiberloss (sorting test mandatory)	Sleeves that hinder the recognition of the PE; Sleeves in non PO-materials with density < 1 g/cm³; Cardboard sleeves with fibreloss during recycling process; Aluminium; Metallised sleeves; Heavily inked sleeves; PVC
DECORATION**	DIRECT PRINTING	Laser marked; Production or best-before date; Direct printing (inks + lacquer) representing < 1 wt% of the total packaging (except dark colours)	Any other direct printing; Cold transfer and hot stamping technologies that does not hinder the recognition of the underlaying PE-polymer	
DECORATION**	OTHER DECORATIVE TECHNOLOGIES		Electroplating on attachments (with density > 1 g/cm³)	Electroplating on attachments (with density < 1 g/cm³)

(4) **RECYCLED CONTENT:** No change in the recyclability assessment. A separate 'Recycled Plastics Traceability Certification' based on a Chain of Custody approach is available with RecyClass

* Polymer resin can be either fossil- or bio-based, virgin or recycled.

** Decorative technologies must not hinder the recognition of the underlaying PE-polymer. Features as size, print, mass colouration and/or barrier might require to perform a Sorting Evaluation Protocol. Known misleading features are listed on the RecyClass Methodology and the following size indications can be considered to ensure the recognition of PE:
- Size of non-PE detectable surfaces on containers > 500 ml: < 70% coverage
- Size of non-PE detectable surfaces on containers < 500 ml: < 50% coverage

(5) *Last update: September 2022*

1. PACKAGING TYPE

Referring to a specific stream available in Europe. Three parameters are considered: nature of the polymer, form and colour of the packaging.

2. LEVELS OF COMPATIBILITY

Traffic-light system.

3. PACKAGING COMPONENTS / FEATURES

The Guidelines look to packaging components known to have an impact on the packaging recycling process. If a feature is not covered by the Guidelines, it means that its recyclability has yet to be evaluated and tested.

4. FOOTNOTES

Footnotes clarify specific classifications or inform users about ongoing testing campaigns by RecyClass Technical Committees.

5. VERSION TRACKING

The Guidelines are living documents, as they are continuously updated by plastics value chain experts based on new scientific findings.

RecyClass | LEVELS OF COMPATIBILITY

FULL COMPATIBILITY

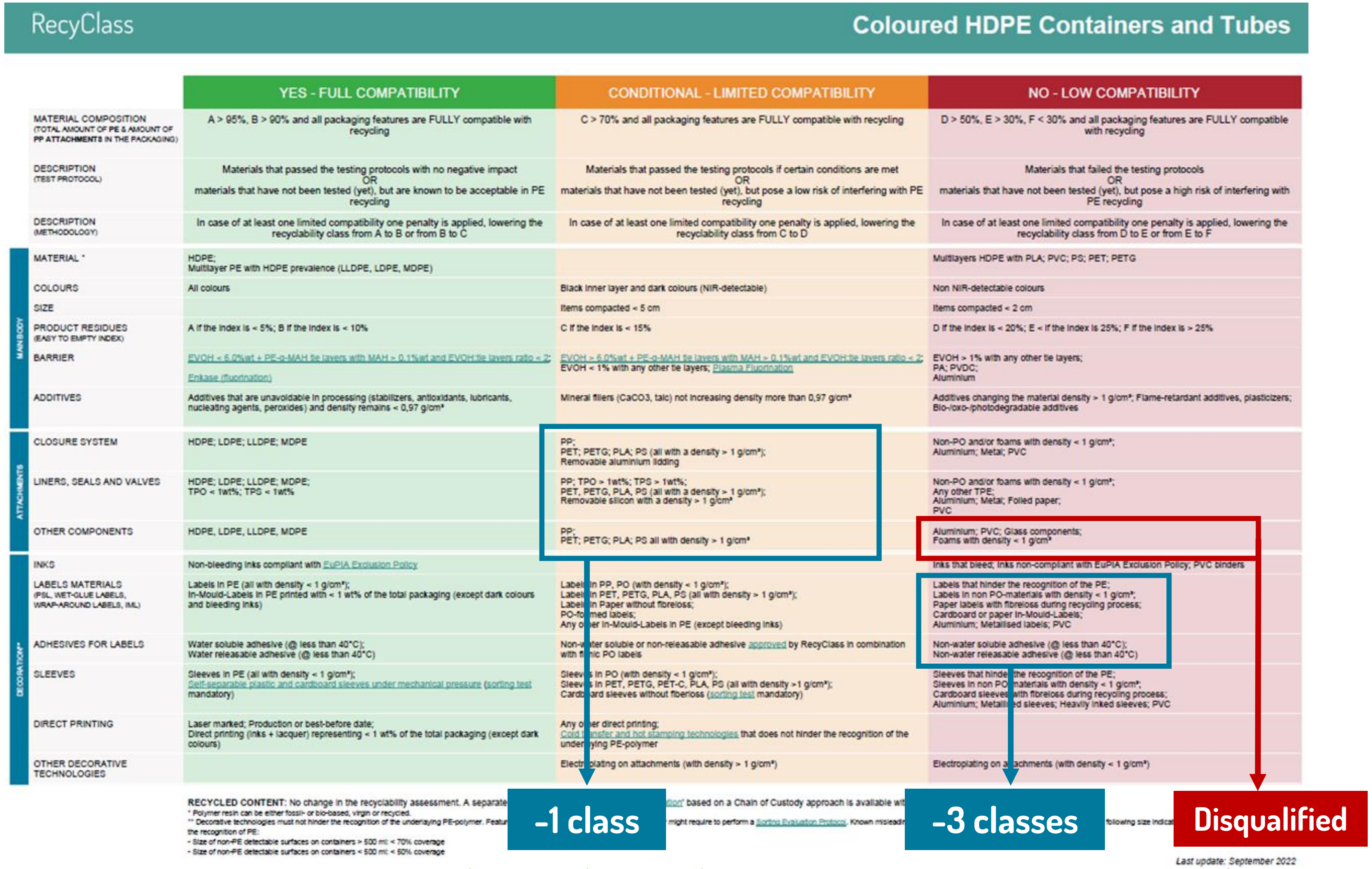
Green column gathers the preferred design features, that guarantee the best recyclability and quality of the recyclate.

LIMITED COMPATIBILITY

Yellow column lists the second choices for each packaging feature, that have been tested or are known to slightly impact the recycling process and/or the quality of the recyclate.

LOW COMPATIBILITY

Red column classifies the detrimental and disqualifying features that should be avoided when designing a packaging, as strongly impacting the recycling and/or the quality of the recyclate.



RecyClass — Coloured HDPE Containers and Tubes

		YES - FULL COMPATIBILITY	CONDITIONAL - LIMITED COMPATIBILITY	NO - LOW COMPATIBILITY
	MATERIAL COMPOSITION (TOTAL AMOUNT OF PE & AMOUNT OF PP ATTACHMENTS IN THE PACKAGING)	A > 95%, B > 90% and all packaging features are FULLY compatible with recycling	C > 70% and all packaging features are FULLY compatible with recycling	D > 50%, E > 30%, F < 30% and all packaging features are FULLY compatible with recycling
	DESCRIPTION (TEST PROTOCOL)	Materials that passed the testing protocols with no negative impact OR materials that have not been tested (yet), but are known to be acceptable in PE recycling	Materials that passed the testing protocols if certain conditions are met OR materials that have not been tested (yet), but pose a low risk of interfering with PE recycling	Materials that failed the testing protocols OR materials that have not been tested (yet), but pose a high risk of interfering with PE recycling
	DESCRIPTION (METHODOLOGY)	In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from A to B or from B to C	In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from C to D	In case of at least one limited compatibility one penalty is applied, lowering the recyclability class from D to E or from E to F
MAIN BODY	MATERIAL *	HDPE; Multilayer PE with HDPE prevalence (LLDPE, LDPE, MDPE)		Multilayers HDPE with PLA; PVC; PS; PET; PETG
	COLOURS	All colours	Black inner layer and dark colours (NIR-detectable)	Non NIR-detectable colours
	SIZE		Items compacted < 5 cm	Items compacted < 2 cm
	PRODUCT RESIDUES (EASY TO EMPTY INDEX)	A if the index is < 5%; B if the index is < 10%	C if the index is < 15%	D if the index is < 20%; E < if the index is 25%; F if the index is > 25%
	BARRIER	EVOH < 6.0%wt + PE-g-MAH tie layers with MAH > 0.1%wt and EVOH:tie layers ratio < 2; Enkase (fluorination)	EVOH > 6.0%wt + PE-g-MAH tie layers with MAH > 0.1%wt and EVOH:tie layers ratio < 2; EVOH < 1% with any other tie layers; Plasma Fluorination	EVOH > 1% with any other tie layers; PA; PVDC; Aluminium
	ADDITIVES	Additives that are unavoidable in processing (stabilizers, antioxidants, lubricants, nucleating agents, peroxides) and density remains < 0,97 g/cm³	Mineral fillers (CaCO3, talc) not increasing density more than 0,97 g/cm³	Additives changing the material density > 1 g/cm³; Flame-retardant additives, plasticizers; Bio-/oxo-/photodegradable additives
ATTACHMENTS	CLOSURE SYSTEM	HDPE; LDPE; LLDPE; MDPE	PP; PET; PETG; PLA; PS (all with a density > 1 g/cm³); Removable aluminium lidding	Non-PO and/or foams with density < 1 g/cm³; Aluminium; Metal; PVC
	LINERS, SEALS AND VALVES	HDPE; LDPE; LLDPE; MDPE; TPO < 1wt%; TPS < 1wt%	PP; TPO > 1wt%; TPS > 1wt%; PET, PETG, PLA, PS (all with a density > 1 g/cm³); Removable silicon with a density > 1 g/cm³	Non-PO and/or foams with density < 1 g/cm³; Any other TPE; Aluminium; Metal; Foiled paper; PVC
	OTHER COMPONENTS	HDPE, LDPE, LLDPE, MDPE	PP; PET; PETG; PLA; PS all with density > 1 g/cm³	Aluminium; PVC; Glass components; Foams with density < 1 g/cm³
DECORATION**	INKS	Non-bleeding inks compliant with EuPIA Exclusion Policy		Inks that bleed; Inks non-compliant with EuPIA Exclusion Policy; PVC binders
	LABELS MATERIALS (PSL, WET-GLUE LABELS, WRAP-AROUND LABELS, IML)	Labels in PE (all with density < 1 g/cm³); In-Mould-Labels in PE printed with < 1 wt% of the total packaging (except dark colours and bleeding inks)	Labels in PP, PO (with density < 1 g/cm³); Labels in PET, PETG, PLA, PS (all with density > 1 g/cm³); Labels in Paper without fibreloss; PO-formed labels; Any other In-Mould-Labels in PE (except bleeding inks)	Labels that hinder the recognition of the PE; Labels in non PO-materials with density < 1 g/cm³; Paper labels with fibreloss during recycling process; Cardboard or paper In-Mould-Labels; Aluminium; Metallised labels; PVC
	ADHESIVES FOR LABELS	Water soluble adhesive (@ less than 40°C); Water releasable adhesive (@ less than 40°C)	Non-water soluble or non-releasable adhesive approved by RecyClass in combination with [illegible] PO labels	Non-water soluble adhesive (@ less than 40°C); Non-water releasable adhesive (@ less than 40°C)
	SLEEVES	Sleeves in PE (all with density < 1 g/cm³); Self-separable plastic and cardboard sleeves under mechanical pressure (sorting test mandatory)	Sleeves in PO (with density < 1 g/cm³); Sleeves in PET, PETG, PET-C, PLA, PS (all with density >1 g/cm³); Cardboard sleeves without fiberloss (sorting test mandatory)	Sleeves that hinder the recognition of the PE; Sleeves in non PO materials with density < 1 g/cm³; Cardboard sleeves with fibreloss during recycling process; Aluminium; Metallised sleeves; Heavily inked sleeves; PVC
	DIRECT PRINTING	Laser marked; Production or best-before date; Direct printing (inks + lacquer) representing < 1 wt% of the total packaging (except dark colours)	Any other direct printing; Cold transfer and hot stamping technologies that does not hinder the recognition of the underlying PE-polymer	
	OTHER DECORATIVE TECHNOLOGIES		Electroplating on attachments (with density > 1 g/cm³)	Electroplating on attachments (with density < 1 g/cm³)

RECYCLED CONTENT: No change in the recyclability assessment. A separate [illegible] based on a Chain of Custody approach is available wi[illegible]

* Polymer resin can be either fossil- or bio-based, virgin or recycled.

** Decorative technologies must not hinder the recognition of the underlaying PE-polymer. Featu[illegible] might require to perform a Sorting Evaluation Protocol. Known misleadi[illegible] following size indica[illegible] the recognition of PE:

- Size of non-PE detectable surfaces on containers > 500 ml: < 70% coverage
- Size of non-PE detectable surfaces on containers < 500 ml: < 60% coverage

Last update: September 2022

RecyClass | CASE STUDY

LEGEND
- + No class deduction
- ~ One class deduction (15% rate deduction)
- X 3 or 5 classes deduction (45% rate deduction)

CLOSURE SYSTEM
- + Same material as container
- ~ PP; Other materials with density > 1 g/cm3
- X Aluminium, metal, PVC

ADHESIVE FOR LABELS
- + Water releasable or soluble adhesive
- ~ Non-water soluble or non-releasable adhesive approved by RecyClass in combination with filmic PO labels
- X Not approved adhesive

MAIN BODY OF THE PACKAGING
Ideally, packaging should be mono-material.
- + HDPE or multilayer PE with HDPE prevalence
- X Multilayer with PLA, PVC, PS, PET, PETG

LABEL & SLEEVE
- + Same material as container
- ~ PP, PO (density < 1 g/cm^3); PET, PETG, PLA, PS (all with density > 1 g/cm^3); paper without fibreloss
- X Labels/sleeves hindering the NIR detection, paper with fibre loss, non detachable PET labels

COLOURATION
- + Light colours
- ~ Dark colours, black inner layer
- X Non-NIR detectable colours

INKS & DECORATIONS
- + Direct printing representing < 1wt% of the total packaging
- ~ Direct printing; cold transfer and hot stamping
- X Inks that bleed; inks non-compliant with EuPIA; PVC binders; printing hindering the NIR-detection

BARRIER TECHNOLOGIES
- + <6wt% of EVOH with PE-based tie layer
- ~ >6wt% of EVOH with PE-based tie layer or <1wt% of EVOH with any other tie layer
- X >1wt% of EVOH with any other tie layer

Check the Design Book online!

RecyClass | CERTIFICATIONS

RecyClass Recyclability Certification Scheme, based on **RecyClass Methodology** and **DfR Guidelines** and verified by **third-party check**

FINAL PACKAGE

Based on the RecyClass Methodology

RecyClass Design for Recycling Certification

- ✓ Technical Assessment
- ✓ Class Ranking from A to F
- ✓ Valid for the EU market
- ✓ Based on the European plastic waste streams
- ✓ Packaging design, sorting behaviour, end-markets included within Assessment
- ✓ Third-party certification

RecyClass Recyclability Rate Certification

+ 90%

- ✓ Quantitative Assessment
- ✓ Class Ranking from A to F & Recyclability Rate from 0 to 100%
- ✓ Country-specific: based on the availability of local collection infrastrucutres
- ✓ Based on the European plastic waste streams
- ✓ Packaging design, sorting behaviour, end-markets included within Assessment
- ✓ Third-party certification
- ✓ On-pack certification mark with class ranking

SEMI-FINISHED PACKAGE

LETTER OF COMPATIBILITY

- ✓ **Class Ranking from A to F**
- ✓ Valid for the **EU market**
- ✓ Based on the **European plastic waste streams**
- ✓ Packaging design, sorting behaviour, end-markets included
- ✓ Mainly destinated to **converters**
- ✓ **Use of the recyclability logos forbidden and only B2B communications are permitted**
- ✓ **Recommendation to certify the final packaging as next step**

RecyClass

KEY TAKEAWAYS

- ✓ **Every packaging component** counts
- ✓ **Fact-based**, **standardised** & **harmonised** approach, based on **state-of-the-art** technologies and processes, is key for uniform uptake of design for recycling principles
- ✓ Design for recycling safeguards the **quality of plastics** that will be available on the market in the future
- ✓ Companies that want to stay at the forefront of the circular plastic transition must **start implementing design for recycling today**

RecyClass
FOR BEGINNERS

Questions & Answers

Use the Q&A box in the top-right corner of your screen

GET IN TOUCH WITH US!
info@recyclass.eu
www.recyclass.eu

RecyClass
FOR BEGINNERS

Thank you for participating!

Stay tuned for the 2023 schedule:

www.recyclass.eu/events

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