

RecyClass

RecyClass for PET



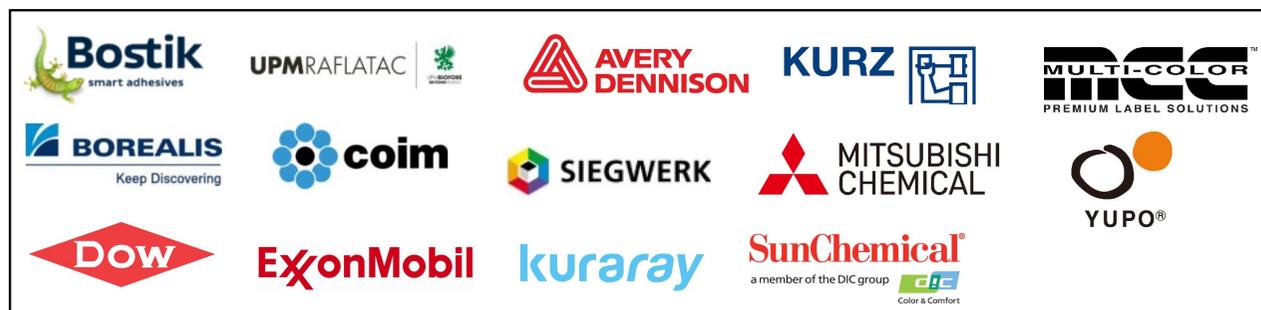
***“Assesses, improves and endorses the recyclability
& recycled content in plastic packaging”***

RECYCLASS

MAKING PLASTIC PACKAGING CIRCULAR

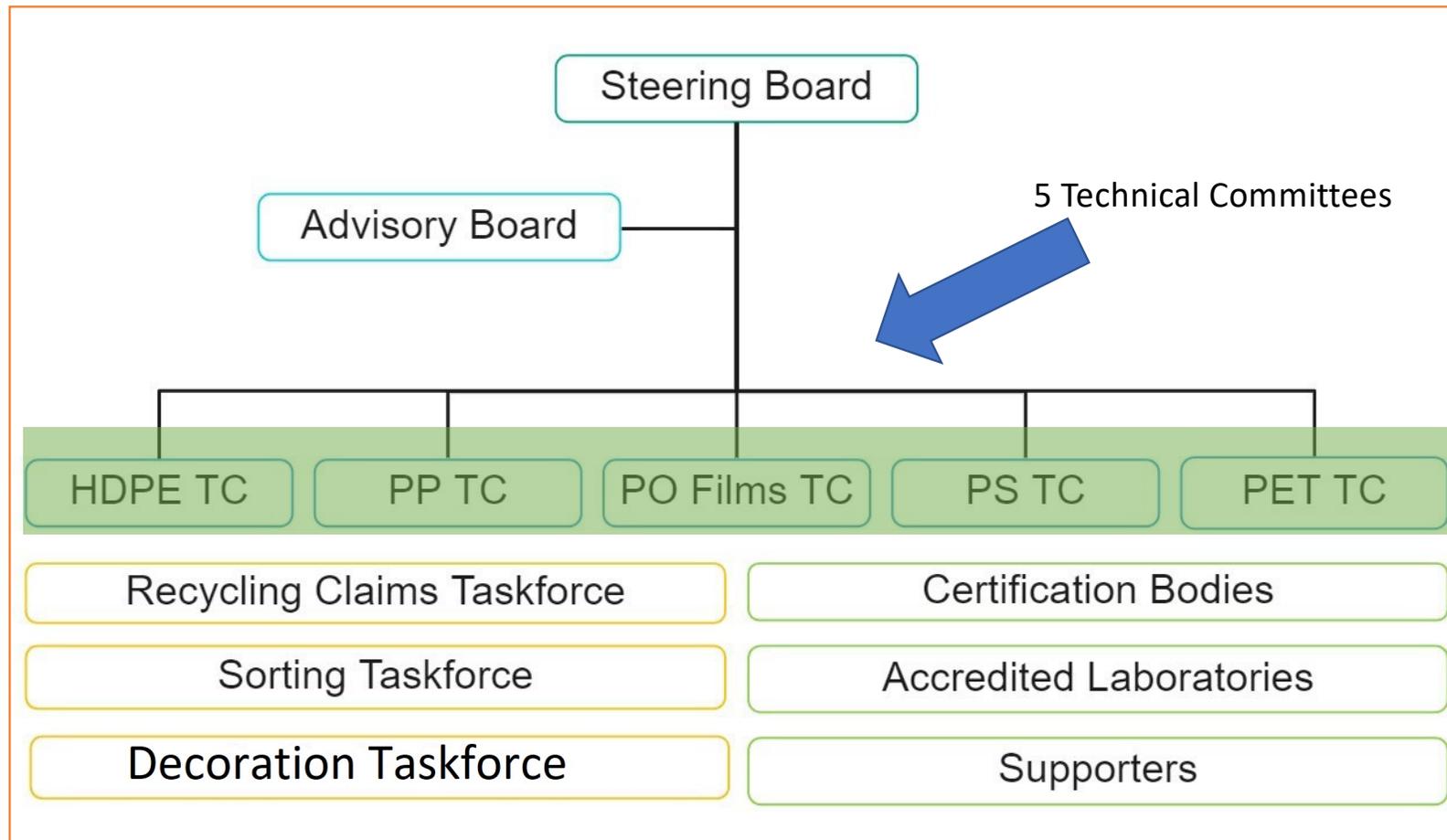


RecyClass members & supporters



RecyClass

Platform Structure



RecyClass

PET: a synergic value chain approach



Develops and maintains testing protocols and manage applications to assess **PET bottles** recyclability

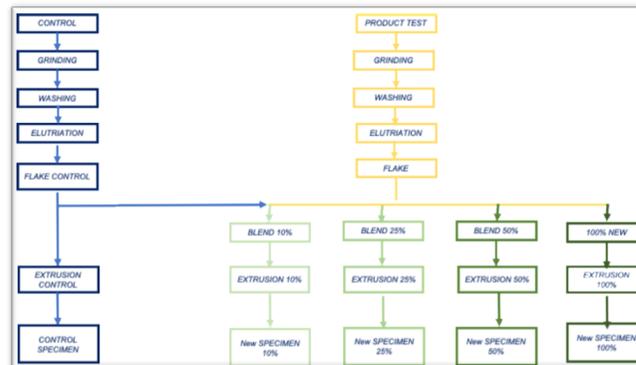
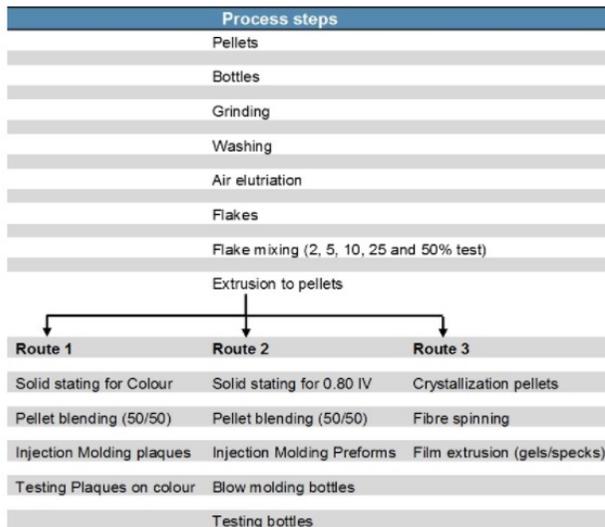


Develops and maintains testing protocols and manage applications to assess **PET trays** recyclability



RecyClass

Recyclability methodology (based on EPBP&Petcore guidelines) and certification for recyclability and recycled content



RecyClass





RecyClass

1. Recyclability assessment with RecyClass

How does RecyClass work?

Recyclability Evaluation Protocols



Design for Recycling Guidelines

TRANSPARENT CLEAR & LIGHT-BLUE PET BOTTLES

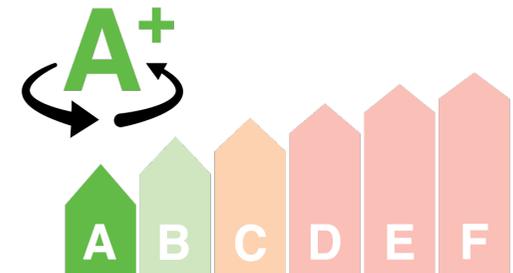
	YES - FULL COMPATIBILITY A-B	CONDITIONAL - LIMITED COMPATIBILITY B-C	NO - LOW COMPATIBILITY D-E-F
CLASS RANKING*	A-B	B-C	D-E-F
DESCRIPTION (Final Product)	Materials that passed the testing protocols with no negative impact OR materials that have not been tested (yet), but are known to be acceptable in PET 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 PET recycling.	Materials that failed the testing protocols OR materials that have not been tested (yet), but pose a high risk of interfering with PET recycling.
BOTTLE**	PET	Co-ket PET content < 10%	<ul style="list-style-type: none"> PA, PCL, PPL, PETG 2 when PET content >= 50%, 3 when PET content <= 50% 2 when PET content <= 50% Other transparent colors, Opaque Fluorescent, Metallic 2 if non-transparent, 3 if clear
MATERIAL COMPOSITION	2 when PET content <= 50%, 3 when PET content >= 50%	Co-ket PET content < 10%	<ul style="list-style-type: none"> PA, PCL, PPL, PETG 2 when PET content >= 50%, 3 when PET content <= 50% 2 when PET content <= 50% Other transparent colors, Opaque Fluorescent, Metallic 2 if non-transparent, 3 if clear
COLORS	Transparent Clear, Transparent Light Blue		
SIZE			
PRODUCT RESIDUES (Cap or Top Label)	A if the index <= 10%, B if the index > 10%	C if the index <= 10%	D if the index <= 10%, E if the index > 10%, F if the index > 10%
BARBER	Self-etching coating	<ul style="list-style-type: none"> Carbon plasma coating, PA-MDPE multilayer with 100% PA-MDPE and no tie layer; PA multilayer PET/Alty UV stabilizers, Acrylate/urea (AA) blockers; Special high-pressure oxygen scavengers. 	<ul style="list-style-type: none"> PA-MDPE multilayer with 100% PA-MDPE or with tie layer; Aluminum PA-MDPE based OPA; UV stabilizers, Acrylate/urea blockers; Special high-pressure oxygen scavengers.
ADDITIVES			
CLOSURE SYSTEM	PE (with density <= 0.92 g/cm ³), PP (with density <= 0.90 g/cm ³)	Silicone with density <= 1.2 g/cm ³	<ul style="list-style-type: none"> Materials and blends with density <= 1.2 g/cm³ (e.g. highly filled PE, metals, ...) Non-bleaching modified ethylenes Materials with density > 1.2 g/cm³ (e.g. PVC, silicone, metals) Labels which hinder the recognition of the underlying PET polymer (e.g. foil tags, metallic foils, etc.) Labels with density > 1.2 g/cm³ (e.g. PVC, PET, PETG, PLA); Labels with density <= 1.2 g/cm³ (e.g. PET, PETG, PETG, PLA); Paper labels with thermally fused PETG labels (even with density <= 1.2 g/cm³); PET labels with washable inks.
UNDER-SEAL AND VALUES	Labels in PE, PP, OPP, EPS, foamed PET (all with density <= 1.2 g/cm ³), with a size that does not hinder the recognition of the underlying PET polymer	Labels with density <= 1.2 g/cm ³	Labels which hinder the recognition of the underlying PET polymer (e.g. foil tags, metallic foils, etc.)
LABELS	<ul style="list-style-type: none"> *Indication label size of bottles >= 100 ml <= 20% coverage Condition label size of bottles <= 100 ml <= 10% coverage 	Labels with density <= 1.2 g/cm ³	Labels which hinder the recognition of the underlying PET polymer (e.g. foil tags, metallic foils, etc.)
SLEEVES	<ul style="list-style-type: none"> *Indication label size of bottles >= 100 ml <= 20% coverage Condition label size of bottles <= 100 ml <= 10% coverage 	Full sleeve transparent for IR detection in PET, PP, OPP, EPS, foamed PET, LDPE/ET, all with density <= 1.2 g/cm ³	<ul style="list-style-type: none"> Materials with density > 1.2 g/cm³ (e.g. PVC, PCL, PET, PETG); foamed PETG sleeves (even with density <= 1.2 g/cm³); PET sleeves with washable inks. Materials with density <= 1.2 g/cm³ (e.g. PET, PETG, PETG, PETG, PETG); foamed PETG sleeves (even with density <= 1.2 g/cm³); PET sleeves with washable inks. Labels which hinder the recognition of the underlying PET polymer (e.g. foil tags, metallic foils, etc.) Labels with density > 1.2 g/cm³ (e.g. PVC, PCL, PET, PETG); foamed PETG sleeves (even with density <= 1.2 g/cm³); PET sleeves with washable inks. Labels with density <= 1.2 g/cm³ (e.g. PET, PETG, PETG, PETG, PETG); foamed PETG sleeves (even with density <= 1.2 g/cm³); PET sleeves with washable inks.
TAMPER EVIDENCE WRAP	PE, PP, OPP, EPS, foamed PET (all with density <= 1.2 g/cm ³)	Full sleeve transparent for IR detection in PET, PP, OPP, EPS, foamed PET, LDPE/ET, all with density <= 1.2 g/cm ³	Labels which hinder the recognition of the underlying PET polymer (e.g. foil tags, metallic foils, etc.)
ADHESIVES FOR LABELS	Alkyl water soluble and alkyl/water insoluble adhesive at 60-80°C without dissolution	Hot-melt; Pressure sensitive labels	Labels which hinder the recognition of the underlying PET polymer (e.g. foil tags, metallic foils, etc.)
INKS	Non-toxic (according to DPM guidelines)	Hot-melt; Pressure sensitive labels	Labels which hinder the recognition of the underlying PET polymer (e.g. foil tags, metallic foils, etc.)
DIRECT PRINTING	Laser marked print	Production or empty date	Labels which hinder the recognition of the underlying PET polymer (e.g. foil tags, metallic foils, etc.)
OTHER COMPONENTS	None (e.g. handles or other components which are separated by grinding and RecyClass, all with density <= 1.2 g/cm ³)	Production or empty date	Labels which hinder the recognition of the underlying PET polymer (e.g. foil tags, metallic foils, etc.)
RECYCLED CONTENT	Unimpregnated PET	Production or empty date	Labels which hinder the recognition of the underlying PET polymer (e.g. foil tags, metallic foils, etc.)

No change in the recyclability assessment. A separate 'Recycled Content Traceability Certificate' based on a Chain of Custody approach is available with RecyClass.

* Class rating resulting from the RecyClass assessment. It takes in account two areas because of the 50-50% amount of PET in the packaging or because of slight incompatibilities in the design.
** Polymer resin can be either fossil or bio-based.



RecyClass Tool



- **Lab testing** of innovative plastic packaging vs control material
- Comparison of properties
- **Technology/Product Approval**

- Design for Recycling (DfR) Guidelines transposed in the tool
- Assessing **overall recyclability** of a finished package

RecyClass

- Recyclability Self-Assessment
- RecyClass Team support
- **Recyclability Certification**

RecyClass PET DfR guidelines

3 Design for Recycling guidelines:

- TRANSPARENT CLEAR & LIGHT-BLUE PET BOTTLES
- TRANSPARENT COLOURED PET BOTTLES
- TRANSPARENT CLEAR MONO PET THERMOFORMING

Full Alignment with EPBP on bottles



TRANSPARENT CLEAR & LIGHT-BLUE PET BOTTLES

CLASS RANKING*	YES - FULL COMPATIBILITY			CONDITIONAL - LIMITED COMPATIBILITY			NO - LOW COMPATIBILITY		
	A-B			B-C			D-E-F		
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 PET 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 PET recycling			Materials that failed the testing protocols OR materials that have not been tested (yet), but pose a high risk of interfering with PET recycling		
BOTTLE**	PET			C when PET content is > 70%			PLA; PVC; PS; PETG		
MATERIAL COMPOSITION	A when PET content is > 95%; B when PET content is > 90%			C when PET content is > 70%			D when PET content is > 50%; E when PET content is > 30%; F when PET content is > 30%		
COLORS	Transparent clear; Transparent light blue			C when PET content is > 70%			Other transparent colours; Opaque; Fluorescence; Metallic		
SIZE	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%		
PRODUCT RESIDUES (Easy to Empty index)	SiOx plasma coating			Carbon plasma-coating; PA-MXD6 multilayer with <5wt% PA-MXD6 and no tie layers; PGA multilayer; PTH alloy			PA-MXD6 multilayer with <5wt% PA-MXD6 or with tie layers; Monolayer PA-MXD6 blend; EVOH		
BARRIER	SiOx plasma coating			UV stabilizers; Ketalddehyde (AA) blockers; Optical brighteners; Oxygen scavengers			Bio-/oxo-/photodegradable additives; Nanocomposites		
ADDITIVES	PE (with density <1 g/cm ³); PP (with density <1 g/cm ³); PE; EVA; PP; foamed PET (all with a density <1 g/cm ³)			Silicone with density <0.95g/cm ³			Materials and blends with density >1 g/cm ³ (e.g. highly filled PE, metals,...); Non-detaching or welded closures		
CLOSURE SYSTEM	Labels in PE, PP, OPP, EPS; foamed PET (all with density <1 g/cm ³), with a size that does not hinder* the recognition of the underlying PET-polymer			Lightly metallized labels; Paper labels without fibrous			Labels which hinder the recognition of the underlying PET-polymer (e.g. too large, metallized, heavily inked); Labels with density >1 g/cm ³ (e.g. PVC, PS; PET; PETG; PLA); Metallized labels; Non-detaching or welded labels; Paper labels with fibrous; Foamed PETG labels (even with density <1 g/cm ³); PET labels with washable inks		
LINERS, SEALS AND VALVES	Sleeves in PE, PP, OPP, EPS; foamed PET; LDPE (all with density <1 g/cm ³), with a size that does not hinder* the recognition of the underlying PET-polymer			Full sleeves translucent for IR detection in PE, PP, OPP, EPS; foamed PET; LDPE; all with density <1 g/cm ³			Sleeves which hinder the recognition of the underlying PET-polymer (e.g. too large, metallized, heavily inked); Sleeves with density >1 g/cm ³ (e.g. PVC, PS; PET; PETG); Foamed PETG sleeves (even with density <1 g/cm ³); PET sleeves with washable inks		
LABELS	*Indication label size of bottles > 500 ml < 70% coverage *Indication label size of bottles < 500 ml < 50% coverage			INTERIM: Twin perforated sleeves for household and personal care conform guidelines by EPBP			Materials with density >1 g/cm ³ (e.g. metal, PVC, PS; PET; PETG); Metallized materials; Foamed PETG (even with density <1 g/cm ³); PET with washable inks		
SLEEVES	*Indication sleeve size of bottles > 500 ml < 70% coverage *Indication sleeve size of bottles < 500 ml < 50% coverage			Production or expiry date			Non-soluble in water or alkaline at 60-80°C; Non-releasable in water or alkaline at 80°C		
TAMPER EVIDENCE WRAP	PE; PP; OPP; EPS; Foamed PET (all with density <1 g/cm ³)			Hot-melts; Pressure-sensitive labels			Inks that bleed; Toxic or hazardous inks; Metallic inks		
ADHESIVES FOR LABELS	Alkali/water soluble and alkali/water releasable adhesive at 60-80°C without reactivation			Production or expiry date			Any other direct printing		
INKS	Non-toxic (according to EUPA guidelines)			Production or expiry date			Materials with density >1 g/cm ³ (e.g. metal, RFID tags); Non-detaching or welded components		
DIRECT PRINTING	Laser marked print			Production or expiry date			Coloured PET		
OTHER COMPONENTS	Base cap, handles or other components which are separated by grinding and float/sink - all with density <1 g/cm ³ ; Unpigmented PET			Production or expiry date			Materials with density >1 g/cm ³ (e.g. metal, PVC, PS; PET; PETG); Metallized materials; Foamed PETG (even with density <1 g/cm ³); PET with washable inks		
RECYCLED CONTENT	No change in the recyclability assessment. A separate 'Recycled Content Traceability Certification' based on a Chain of Custody approach is available with RecyClass			Production or expiry date			Non-soluble in water or alkaline at 60-80°C; Non-releasable in water or alkaline at 80°C		

Last update: February

* Class ranking resulting from the RecyClass assessment. B class is reported two times because of the 90-95% amount of PET in the packaging or because of slight incompatibilities in the design.
** Polymer resin can be either fossil- or bio-based.



TRANSPARENT COLOURED PET BOTTLES

CLASS RANKING*	YES - FULL COMPATIBILITY			CONDITIONAL - LIMITED COMPATIBILITY			NO - LOW COMPATIBILITY		
	A-B			B-C			D-E-F		
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 PET 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 PET recycling			Materials that failed the testing protocols OR materials that have not been tested (yet), but pose a high risk of interfering with PET recycling		
BOTTLE**	PET			C when PET content is > 70%			PLA; PVC; PS; PETG		
MATERIAL COMPOSITION	A when PET content is > 95%; B when PET content is > 90%			C when PET content is > 70%			D when PET content is > 50%; E when PET content is > 30%; F when PET content is > 30%		
COLORS	Transparent light colours			C when PET content is > 70%			Opaque; Fluorescence; Metallic		
SIZE	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%		
PRODUCT RESIDUES (Easy to Empty index)	SiOx coating; Carbon plasma-coating; PA-MXD6 multilayer with <5wt% PA-MXD6 and no tie layers; PTH alloy			EVOH multilayer with <3wt% EVOH or with tie layers; PA-MXD6 multilayer with <5wt% PA-MXD6 including tie layers; Monolayer PA-MXD6; PGA multilayer; UV stabilizers; Acetalddehyde (AA) blockers; Optical brighteners; Oxygen scavengers			Bio-/oxo-/photodegradable additives; Nanocomposites		
BARRIER	SiOx coating; Carbon plasma-coating; PA-MXD6 multilayer with <5wt% PA-MXD6 and no tie layers; PTH alloy			UV stabilizers; Ketalddehyde (AA) blockers; Optical brighteners; Oxygen scavengers			Materials and blends with density >1 g/cm ³ (e.g. highly filled PE, metals,...); Non-detaching or welded closures		
ADDITIVES	PE (with density <1 g/cm ³); PP (with density <1 g/cm ³); PE; EVA; PP; foamed PET (all with a density <1 g/cm ³)			Silicone with density <0.95g/cm ³			Labels which hinder the recognition of the underlying PET-polymer (e.g. too large, metallized, heavily inked); Labels with density >1 g/cm ³ (e.g. PVC, PS; PET; PETG; PLA); Metallized labels; Non-detaching or welded labels; Paper labels with fibrous; Foamed PETG labels (even with density <1 g/cm ³); PET labels with washable inks		
CLOSURE SYSTEM	Labels in PE, PP, OPP, EPS; foamed PET (all with density <1 g/cm ³), with a size that does not hinder* the recognition of the underlying PET-polymer			Lightly metallized labels; Paper labels without fibrous			Labels which hinder the recognition of the underlying PET-polymer (e.g. too large, metallized, heavily inked); Labels with density >1 g/cm ³ (e.g. PVC, PS; PET; PETG; PLA); Metallized labels; Non-detaching or welded labels; Paper labels with fibrous; Foamed PETG labels (even with density <1 g/cm ³); PET labels with washable inks		
LINERS, SEALS AND VALVES	Sleeves in PE, PP, OPP, EPS; foamed PET; LDPE (all with density <1 g/cm ³), with a size that does not hinder* the recognition of the underlying PET-polymer			Full sleeves translucent for IR detection in PE, PP, OPP, EPS; foamed PET; LDPE; all with density <1 g/cm ³			Sleeves which hinder the recognition of the underlying PET-polymer (e.g. too large, metallized, heavily inked); Sleeves with density >1 g/cm ³ (e.g. PVC, PS; PET; PETG); Foamed PETG sleeves (even with density <1 g/cm ³); PET sleeves with washable inks		
LABELS	*Indication label size of bottles > 500 ml < 70% coverage *Indication label size of bottles < 500 ml < 50% coverage			INTERIM: Twin perforated sleeves for household and personal care conform guidelines by EPBP			Materials with density >1 g/cm ³ (e.g. metal, PVC, PS; PET; PETG); Metallized materials; Foamed PETG (even with density <1 g/cm ³); PET with washable inks		
SLEEVES	*Indication sleeve size of bottles > 500 ml < 70% coverage *Indication sleeve size of bottles < 500 ml < 50% coverage			Production or expiry date			Non-soluble in water or alkaline at 60-80°C; Non-releasable in water or alkaline at 80°C		
TAMPER EVIDENCE WRAP	PE; PP; OPP; EPS; Foamed PET (all with density <1 g/cm ³)			Hot-melts; Pressure-sensitive labels			Inks that bleed; Toxic or hazardous inks; Metallic inks		
ADHESIVES FOR LABELS	Alkali/water soluble and alkali/water releasable adhesive at 60-80°C without reactivation			Production or expiry date			Materials with density >1 g/cm ³ (e.g. metal, PVC, PS; PET; PETG); Metallized materials; Foamed PETG (even with density <1 g/cm ³); PET with washable inks		
INKS	Non-toxic (according to EUPA guidelines)			Production or expiry date			Non-soluble in water or alkaline at 60-80°C; Non-releasable in water or alkaline at 80°C		
DIRECT PRINTING	Laser marked print			Production or expiry date			Inks that bleed; Toxic or hazardous inks; Metallic inks		
OTHER COMPONENTS	Base cap, handles or other components which are separated by grinding and float/sink - all with density <1 g/cm ³ ; Unpigmented PET			Production or expiry date			Any other direct printing		
RECYCLED CONTENT	No change in the recyclability assessment. A separate 'Recycled Content Traceability Certification' based on a Chain of Custody approach is available with RecyClass			Production or expiry date			Materials with density >1 g/cm ³ (e.g. metal, PVC, PS; PET; PETG); Metallized materials; Foamed PETG (even with density <1 g/cm ³); PET with washable inks		

Last update: February 2021

* Class ranking resulting from the RecyClass assessment. B class is reported two times because of the 90-95% amount of PET in the packaging or because of slight incompatibilities in the design.
** Polymer resin can be either fossil- or bio-based.

RecyClass

RecyClass PET DfR guidelines

Design for Recycling guidelines:

- TRANSPARENT CLEAR & LIGHT-BLUE PET BOTTLES
- TRANSPARENT COLOURED PET BOTTLES
- TRANSPARENT CLEAR MONO PET THERMOFORMING

Full Alignment with Petcore on PET trays



RecyClass



TRANSPARENT CLEAR MONO PET THERMOFORMING

CLASS RANKING*	Assessing Protocols		
	YES - FULL COMPATIBILITY	CONDITIONAL - LIMITED COMPATIBILITY	NO - Low COMPATIBILITY
DESCRIPTION (Test Protocol)	A-B 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 PET recycling	B-C 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 PET recycling	D-E-F Materials that failed the testing protocols OR materials that have not been tested (yet), but pose a high risk of interfering with PET recycling
TRAY**	PET		
MATERIAL COMPOSITION	A when PET content is > 95%; B when PET content is > 90%	C when PET content is > 70%	Any PET based multilayer material including PET/PE; PLA; PVC; PS; PETG; C-PET; PET-GAG; Expanded PET
COLOURS	Transparent clear; Transparent light blue		D when PET content is > 50%; E when PET content is > 30%; F when PET content is < 30%
SIZE		Items compacted < 5 cm	Opaque; Other transparent colours; Metallic; Opaque
PRODUCT RESIDUES (Easy to Empty index)	A if the index is < 5%; B if the index is < 10%	C if the index is < 15%	Items compacted < than 2 cm
BARRIER	PET based oxygen scavenger <u>without</u> yellowing effect after EPBP oven test	PET based oxygen scavenger <u>with limited</u> yellowing effect after EPBP oven test	D if the index is < 20%; E - if the index is 25%; F if the index is > 25%
ADDITIVES	Silicone surface coating (on coating area); Antiblocking masterbatch (max 3%)	UV stabilisers; AA blockers; optical brighteners; antiblocking masterbatch (> 3%); anti-stat agents; antiblocking agents; anti-fogging agents (on coating area)	EVOH; PA; any other barrier; any other oxygen scavenger
CLOSURE SYSTEM (Lidding films)	Unprinted PET; Floating plastics with density < 1 g/cm ³ and easily removal from the tray and without glue residuals; foamed PET based films where foamed structure is not getting destroyed @90°C; SiO ₂ and Al ₂ O ₃ plasma for barrier		Bio/Oxo/Photodegradable additives; Nanocomposites
LABELS	Labels in PE, PP, OPP (all with density < 1 g/cm ³ and also in the more heavily printing area), with a size that does not hinder* the recognition of the underlying PET-polymer <i>* Indication label size of trays: < 30% coverage</i>	BPA-free paper labels without fibreloss during recycling process	Any other film
ADHESIVES FOR LABELS	100% removable adhesives leaving no adhesive residuals on flakes at 70°C	100% removable adhesives leaving no adhesive residuals on flakes at 85°C	Plastic labels with density > 1 g/cm ³ (also in more heavily printed and glued area); Paper labels with fibreloss during recycling process; Paper labels containing BPA; Non floating paper labels
ADHESIVES ON OTHER PARTS THAN LIDDING FILM AND LABELS	Alkali/water soluble or alkali/water releasable adhesive at 60-80°C without reactivation		All other adhesives
INKS	Non toxic following the EuPIA Guidelines		Any other adhesive
DIRECT PRINTING	Laser marked	Production or expiry date	Inks that bleed; Toxic or hazardous inks
OTHER COMPONENTS	Inserts in HDPE / LDPE / PP like Soaker pads, bubble pads (all inserts should be completely removable, leave no traces and have a density of < 1 g/cm ³)	Paper & cardboard not loosing fibres	Any other direct printing PVC / PS / EPS / PU / PA; PC/PMMA; Thermoset plastics/metals; Paper & cardboard loosing fibres
RECYCLED CONTENT	No change in the recyclability assessment. A separate 'Recycled Content Traceability Certification' based on a Chain of Custody approach is available with RecyClass		

* Class ranking resulting from the RecyClass assessment. B class is reported two times because of the 90-95% amount of PET in the packaging or because of slight incompatibilities in the design.
** Polymer resin can be either fossil- or bio-based.

What is the RecyClass online-tool?

- Ranks the recyclability of a plastic packaging
- Evaluates packaging recyclability given the existing recycling streams.



- Gives precise indications on critical points to be improved.



It is based on 5 question areas:

- General questions (packaging composition)
- Compatibility (DfR Guidelines)
- Recycled plastics content
- Easy-to-empty / Easy-to-access index
- REACH compliance

RecyClass

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.

Recyclability Certification: for final package

Design for Recycling Assessment



- Qualitative Assessment: **ranking from A to F**
- Valid for the **EU market**
- Based on the **European plastic waste streams**
- Packaging design, sorting behaviour, end-markets included

Recyclability Rate Assessment



- Quantitative Assessment: **% of recyclable content, in addition to class ranking**
- **Country-specific**
- Based on the **local collection and availability of infrastructures**
- Packaging design, sorting behaviour, end-markets included

Detailed information available at:

<https://recyclclass.eu/recyclclass/recyclability-product-certification/>

RecyClass

Example: PET tray certification

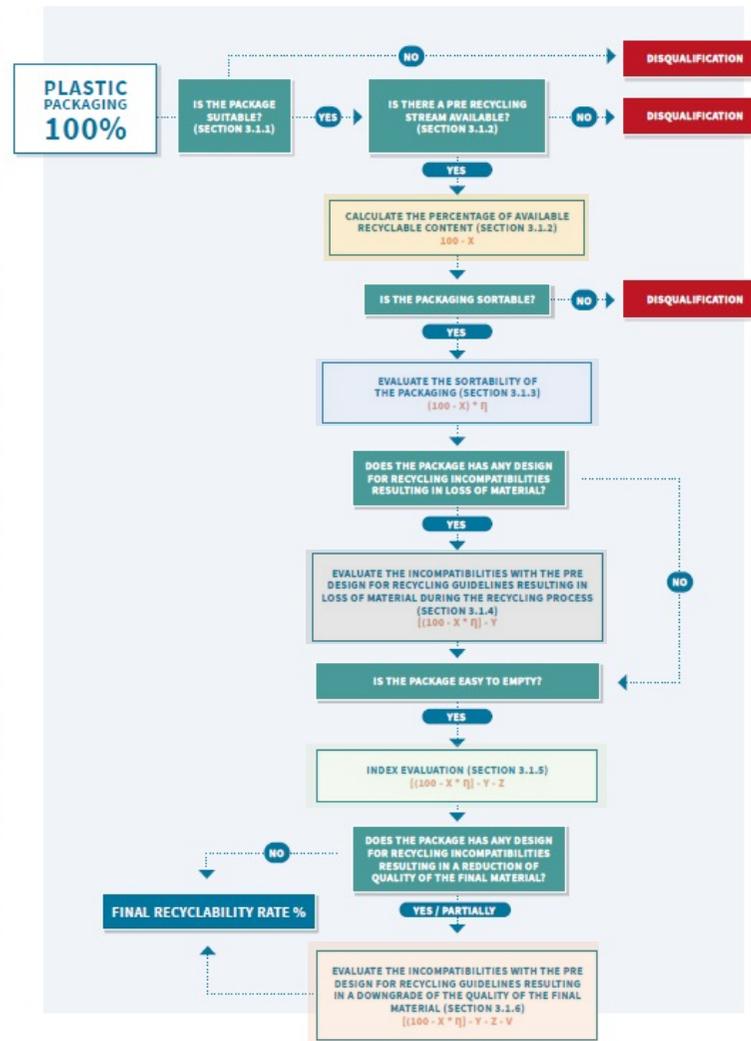


COMPOSITION:

- PET TRAY 73.0%
- PAPER DISPLAY 25.0%
- PE LIDDING FILM 2.0%

ADDITIONAL INFORMATION:

- CLEAR PET TRAY
- PE LIDDING FILM
- 0.1% WATER SOLUBLE ADHESIVE
- NON WELDED/GLUED PAPER DISPLAY



SUITABILITY:

The paper display will be removed and completely separated by the consumer to access the product. The paper display will be then discarded in the paper bin and the tray in the plastic bin.

Then, the tray is suitable for the analysis (made of more than 50% plastic; more than 50% of its surface is made of plastic, etc.)

▷ X = 0; Interim result = (100 - X) = 100%

COLLECTION:

PRE recycling stream exists

▷ Interim result = (100 - X) = 100%

SORTABILITY:

No carbon black surface, no Al layer > 5 microns, no full sleeves, no dark color, no multilayers, no metal components, label covering < 50% the bottle surface → no need to sorting test

▷ $\eta_{\text{sort}} = 1$ Interim result = (100 - X) * $\eta_{\text{sort}} = 100\%$

DFR COMPATIBILITY:

No disqualifying items

No inserts

The PE lidding film will float and will be discarded (i.e. $-2 / (73+2) = -2,7\%$

The water-soluble adhesive will allow the PE lidding film to be completely detached from the tray (-0,1%)

▷ Y = 2,8 Interim result = [(100 - X) * η_{sort}] - Y = 97,2%

EASY TO EMPTY:

The tray will be completely emptied after use (Index = 0)

▷ Z = 0 Interim result = [(100 - X) * η_{sort}] - Y - Z = 97,2%

REPLACE VIRGIN PLASTIC:

The PET tray is designed with all separable materials/substances

No direct printing is applied on the tray

▷ Final result = [(100 - X) * η_{sort}] - Y - Z - V = 97,2 (Class A)



Example: PET bottle certification



COMPOSITION:

- PET BOTTLE 88,0%
- PP CAP 9,0%
- PE LABEL 3,0%

ADDITIONAL INFORMATION:

- PET BOTTLE WITHOUT BARRIER LAYER
- NO DIRECT PRINTING ON THE BOTTLE
- 0,1% WATER-SOLUBLE ADHESIVE (IN HOT ALKALINE WASH WATER)
- 0,2% PRINTING ON THE LABEL



SUITABILITY:

It is made of more than 50% plastic
 More than 50% of its surface is made of plastic
 The bottle is not coupled with other materials
 ▷ $X = 0$; Interim result = $(100 - X) = 100\%$

COLLECTION:

PRE recycling stream exists
 ▷ Interim result = $(100 - X) = 100\%$

SORTABILITY:

No carbon black surface, No Al layer > 5 microns, No full sleeves, no dark color, no multilayers, no metal components, label covering < 50% the bottle surface -> no need to sorting test
 ▷ $\eta_{\text{sort}} = 1$ Interim result = $(100 - X) * \eta_{\text{sort}} = 100\%$

DFR COMPATIBILITY:

No disqualifying items
 The PP cap will float and will be recycled as by-product
 The PE label will float and will be recycled as by-product
 The water-soluble adhesive will allow the PE label to detach from the bottle (i.e. -0,1%)
 ▷ $Y = 0$ Interim result = $[(100 - X) * \eta_{\text{sort}}] - Y = 99,9\%$

EASY TO EMPTY:

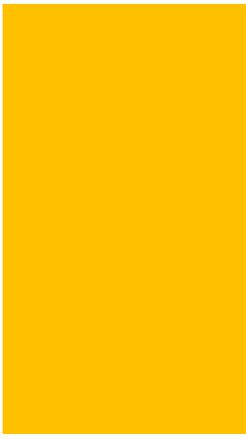
The bottle will be completely emptied after use (Index = 0)
 ▷ $Z = 0$ Interim result = $[(100 - X) * \eta_{\text{sort}}] - Y - Z = 99,9\%$

REPLACE VIRGIN PLASTIC:

The PET bottle is designed with all separable materials/substances
 The PP cap will be recycled in a mix of polyolefin stream (i.e. -9*0,25)
 The label will be recycled in a mix of polyolefin stream (i.e. -3*0,25)
 Adhesive and inks never get recycled and are deducted by the rate (i.e. 3-0,1-0,2)
 ▷ **Final result** = $[(100 - X) * \eta_{\text{sort}}] - Y - Z - V = 99,9 - 9*0,25 - 3*0,25 = 96,9\%$ (Class A)

RecyClass





RecyClass

2. Recycled Content with RecyClass

How to have reliable claims of recycled plastics?

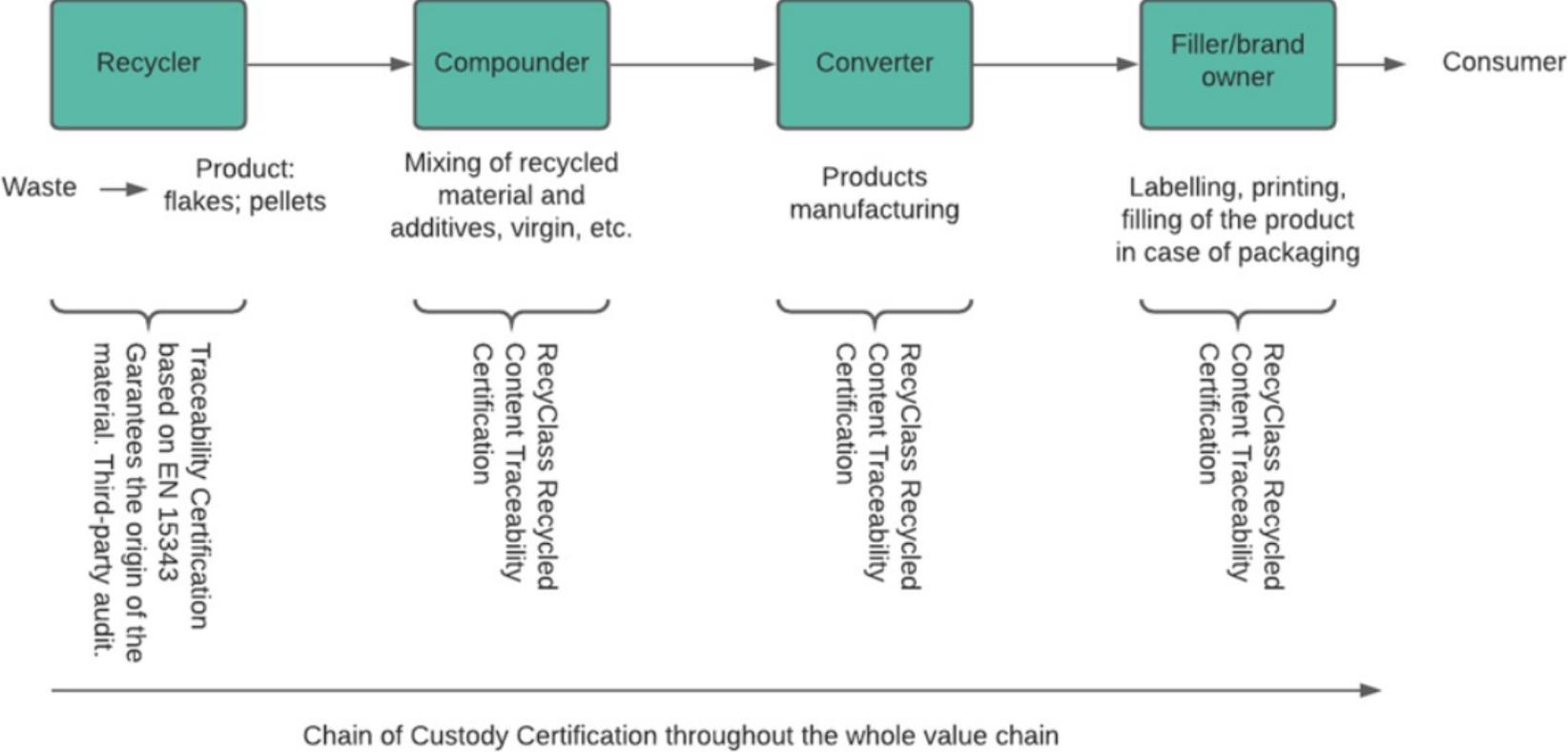
- **Challenges and risks that RecyClass tackles:**

- **Free allocation of recycled content:** Recycled content calculation must refer to real percentages, not credit systems between products, production lines, plants, etc.
- **Self-declaration of origin of waste:** Downstream users declaring origin of material must not be permitted. Origin of the waste must be verified in case of Certification.

RecyClass

Traceability of recycled plastics for reliable claims

The whole value chain matters!



RecyClass

Traceability of recycled plastics for reliable claims

Introduction

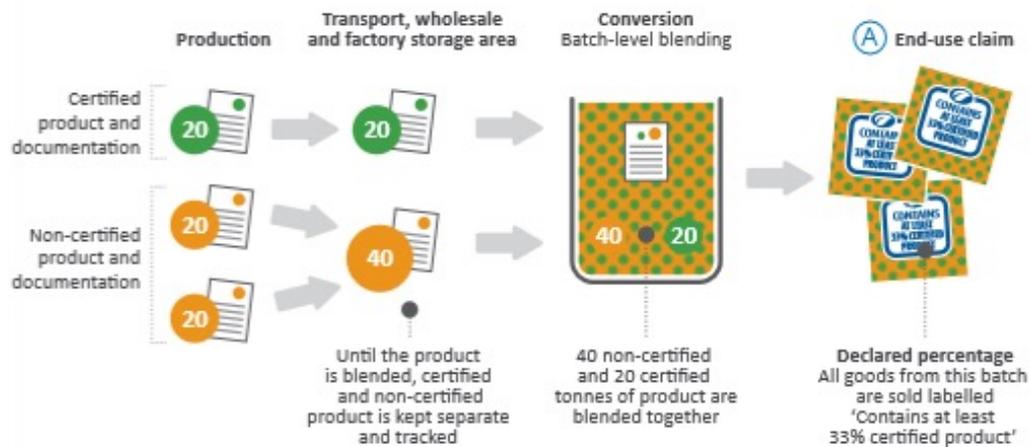
- **Robust and transparent claims** of recycled content are essential to **ensure credibility.**
- **Traceability is KEY** to facilitate verified and transparent claims.
- **Certification is the right tool** to recognise use of recycled plastics.

- **Reassure consumers, provide trust to end-users (B2C)**– increasing public interest in recycled content.
- **Demonstrate compliance with legislation (B2B)**– increasing regulation; address use of claims by a third-party verification.
- **Underpin quality** – ensure certain Standard Operating Procedures are implemented. Problem solving and correction.
- **Show transparency** - information about the waste origin and source.
- **Support corporate sustainability claims** about recycled content.

RecyClass

Recycled Content Traceability Certification

Recycled Content Calculation - Controlled blending



Source: ISEAL Chain of Custody Models

- Recycled content shall be **expressed as percentage** of the total weight of a product or component and **must reflect the real percentage of recycled content** (pre-consumer and post-consumer), following ISO 22095.
- The **calculation of recycled content** can be assigned to a given product or a group of products within the same family (products using the same recipe).
- The **calculation shall consider the plastic weight of the product or component.**

RecyClass

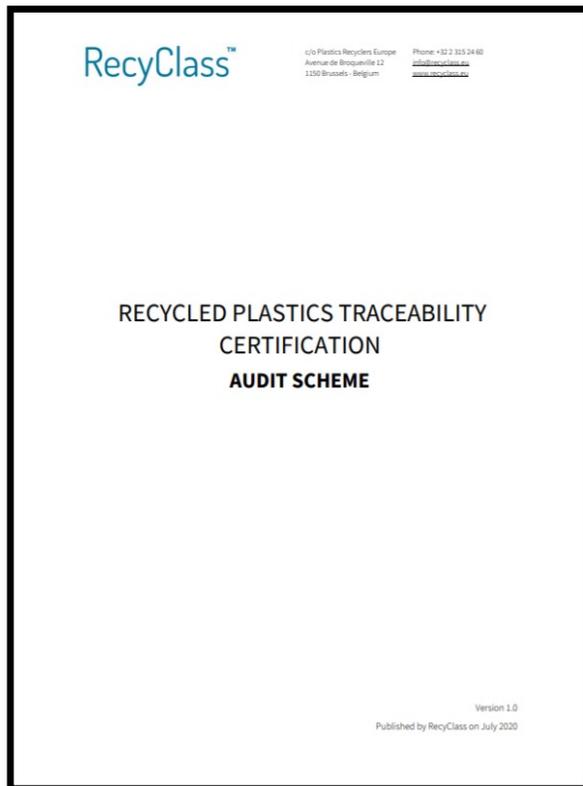
Recycled Content Traceability Certification

The Basics

- Certification focuses on the **traceability evaluation of recycled material flows** in a site producing products with rContent.
- An **independent Certification Body** verifies the traceability of recycled content and the calculation of pre-consumer and post-consumer share in products. This is usually part of a broader value chain. Certificate validity is 1 year.
- The Audit Scheme was developed according to a **controlled blending model** as described in **ISO 22095 Chain of Custody** – General terminology and models and **EN 15343:2007 Plastics recycling traceability and assessment of Conformity and Recycled Content**.

RecyClass

Recycled Content Traceability Certification Audit Scheme



- The **Audit Scheme** was published in July 2020.
- **Procedures & Quality Management Systems**, as well as **Auditors Guidance** were published in October 2020.
- Documents were developed by experts on traceability, converters and brand owners.
- **Trial audits were carried out with converters and brand owners** to test the configuration and fitness of the Certification requirements.
- **15+ Certification Bodies around Europe are recognised** to perform the audit. Two trainings for auditors took place in November and February 2021.
- Documentation available at www.recyclclass.eu

RecyClass



Thank you
for your attention

www.recyclclass.eu

info@recyclclass.eu

RecyClass