

The Digital Product Passport for Packaging

MANUFACTURER

Nieuwegein, November 21st 2023

Conrad von Bonin, EECC GmbH Dirk Bansemer, Euro Plant Tray GmbH Benedikt Brenken, ProData GmbH

Rising demand for information on packaging on a different level!

Required information:

- Product-related data
- Recyclability assessment
- Plastic tax calculation
- EPR schemes
- Proof of recyclate origin and quality
- Extended information requirements (EU legislation)
- Consumer information (marketing)
- Carbon footprint calculation

High effort for data management

Information exchange is time-consuming, costly and control intensive



Problems:

- Time-consuming information allocation
- Costs for obtaining information
- No or insufficient traceability of raw materials
- No standardized information exchange
- No automated data transfer
- No interoperable platform or tools
- Error sources due to manual inputs

R-Cycle – The Digital Product Passport for Packaging

enables standardized data exchange across the entire value chain and company borders.

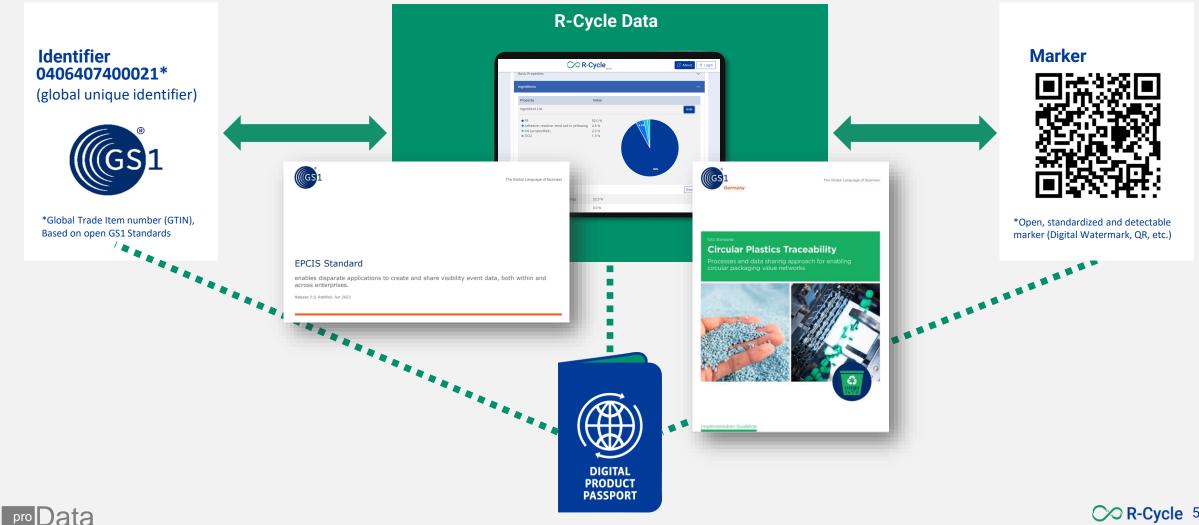


R-Cycle values:

- Dynamic data traceability along the full product lifecycle
- Data aggregation, analysis and automation
- Use of open standards
- Auditable data infrastructure
- Reduced documentation costs and increased efficiency
- Long-term value for brands, e.g. by optimizing EPR eco-modulation
- Different automation levels

Structure of R-Cycle Digital Product Passport

Global and open standards guarantee a future-proof solution



Where are DPPs already being used?

Application example: Shampoo Bottle







Digital Product Passport



EZ About ∂ Login Value Property Hide Ingredient List PE-HD 68.8 % • PP 24.5 % PS 5.3 % TIO2 1.3 % 0.2 % Ink (unspecified) Adhesive, non-reactive 0.0 % Show Additive List MFR Range 0.2-5.0 g/10min @2.16 kg, 190 °C 67.9 % PCR Content (Mechanical Recycling) Bio Based Content 0 % Bio-degradable No Food Approved No Colour of Basic Material Light colour Light colour Colour of Printing

R-Cycle

C^{*} R-Cycle 7

pro Data



Balea

Motivation

- Integration of the complete packaging supply chain
- Aggregation of all packaging data for the Recyclability Assessment
- Integration & automatic data exchange between R-Cycle and recyda
- Creation of transparency for the stakeholders involved
- Automated calculation of the total recycled content (PCR)

National Notational N			C R-Cycle		
Product Data person person person Product Data Image Image Image County Image Image Image County Image Image Image Protect Data Image Image Image Protect Product Data Image Image Image Protect Protect Data Image Image Image Image Image <th>Product Data</th> <th>roduct Tree Map B</th> <th>ickground</th> <th></th> <th></th>	Product Data	roduct Tree Map B	ickground		
Name Nam Name Name				Show Error	: Fiter: Fi
Note: Note: Science: Vale Probaging Weight 26.6 g Drony 6.80 g run? Probaging Weight 26.6 g Drony 6.80 g run? Probaging Weight 26.6 g Probaging Weight 10.0 m. Probaging Weight					
Cuarting Cu	images				
Several Information in Package Kangin I 24 6 g Package Kangin 24 6 g Package Kangin 24 6 g Package Kangin 24 6 g Package Kangin 24 0 m Package Kangin 24 0			8.10°.		
Yolaying Value Propary Value Propary 24.5 g Proving 24.6 g Proving 24.0 mm Proving 24.0 mm Provaging Context workbod noorstaandout Propary Value Propary 23.5 m Propary 23.5 m Propary 23.5 m Propary 23.5 m Propary 24.5 m Propary 24.8 m Propary 24.8 m Propary 24.9 m Propary 24.9 m Propary 24.9 m Propary 24.0 m Propary 2	Quantity				
Volue Volue Program Value 26.6 g Onniny 2.8.6 g Onniny 2.8.6 g Value (steph 2.0 m Processory Value 2.0 m Processory Value 4.0 mm Processory Value 4.0 mm Processory Value Annin	General Information				
Volue Volue Program Value 26.6 g Onniny 2.8.6 g Onniny 2.8.6 g Value (steph 2.0 m Processory Value 2.0 m Processory Value 4.0 mm Processory Value 4.0 mm Processory Value Annin	Basic Properties				
Processing Weight 24.6 g During Bability good Processing Weight 70 mm Processing Weight 40 mm Processing Weight 40 mm Processing Weight 40 mm Processing Weight 100 mm Pro					
Dronly 8.48 grof Packarg Wath 7.0 mm Packarg Wath 4.0 mm Packarg Wath 18.0 mm Packarg Wath 18.0 mm Packarg Wath 18.0 mm Packarg Wath 19.0 mm Participation 22.5 mm Packarg Wath 22.5 mm Packarg Wath 23.5 mm Packarg Wath 23.5 mm Packarg Wath 25.5 mm Packarg Wath 25.6 mm Packarg Wath 25 mm <t< td=""><td></td><td></td><td></td><td></td><td></td></t<>					
PixAgeng Length 71.0 min PixAgeng Kindin 41.0 min PixAgeng Kindin 41.0 min PixAgeng Content monFload noeskaardous Participant Maker Participant monFload noeskaardous Participant Maker Participant Kalling Participant Kalling Participant Kalling Participant Salling Paricipant<					
Packaging Kinglit 155.0 mm Packaging Centert encload neorestantiout Perform Value Paraditation Calibration Instruction Calibration Ins					
Probaging Content menologial constantious Properties Value Properties 0.000 Properties 0.0000 Properties 0.0000 Properties 0.0000 Properties Properties Properties <t< td=""><td>Packaging Width</td><td></td><td>41.0 mm</td><td></td><td></td></t<>	Packaging Width		41.0 mm		
Signation III Value Improduct List 6.8.8.% Improduct List 6.8.6.8.% Improduct List	Packaging Height		186.0 mm		
Property Value Important List	Packaging Content		nonFood-nonHazardous		
	Property		Value		
 Processor Addresser Addresser	Ingredient List				
	PE-HD		68.8 %		
	 PP PS 		5.3 %		<u> </u>
Addres Ltd: Addres Lt	 TIO2 Ink (unspecified) 		1.3 %	24.9%	N
Mail Range 8.25.6 gr them (2.16 kg, 116 V)C PCR context Stechanical Recycling 47.9 % Bio Based Context 8.9 % Bio Based Context 8.9 % Bio Agronovel No Colour of Rank Statemint Upt colour Colour of Rank Statemint Upt colour Colour of Rank Statemint Upt colour Exclored Priving Upt colour Exclored Rank Statemint Upt colour Colour of Rank Statemint Upt colour Exclored Rank Statemint Upt colour Colour of Rank Statemint Upt colour Exclored Rank Statemint Upt colour	Adhesive, non-react	tive	0.0 %		
PRC Concent Unchancel Recycling: 0.2.5 % Bio Based Concent 0.5 % Bio Argenidade Bio Recipient 0.5 % Bio Argenidade Nico Concent 0.5 % Colland of Based Kanada Guerra Concent 0.5 % Colland of Based Market Recensive Difference 0.5 % Prockaping Component 0.5 % Prockaping Compo	Additive List				
Bio Basel Cursent 0.0 % Bio Agroade No No Colour of Principal View View View View View View View View	MFR Range		0.2-5.0 g/10min @2.16 kg	5, 190 °C	
Bo degradade No Picol Agrando No Collar of Bank Marinet Upt Colour Collar of Paring Upt Colour Sockept Components Exclusion Component Parine Parine Parine Exclusion Parine Parine Parine Parine Parine Dotte 20 g. Pa Not emonado 12%		cal Recycling)			
No No Color of Approved Uplt colour Color of Prinning Uplt colour Package Component Weight Main Ingredient Removability Surface Component 20 g PEHO Not removability 0 % Cap 7 g PF Not removability 12 %					
Colour of Nextman Light colour Colour of Princing Light colour Producting Component Kennowskilty Surface Component Vegit Main Impreferet Non Impreferet Surface Dottion 20 g Pt mD Not removable 0 % Colp 7 g Pt Not removable 12 %					
Colour of Princing Light colour Packaging Components Ecomponent Surface Component Weight Main Ingredient Removability Surface Dotate 20.8 PE HO Not removable 0.% Cap 7.8 PP Not removable 12.%		-			
Packapp Component. Component Weight Main Ingredient Removability Surface Dotte 29.g PE+0 Not removability 0.% Cap 7.g PP Not removability 12.%		24			
Component Weight Main Ingredient Removability Surface Dotte 20 g PF-PO Instrumovable 0 % Cop 7 g PF Instrumovable 12 %					
Bottle 20 g PE+ID Not removable 0 % Cap 7 g PP Not removable 12 %					
Cap 7.g PP Not removable 12 %	Packaging Components				Surface Co
	Component				
Sleeve 1.56 g PS Removable by wind sifting / air 88 %	Companent Bottle	20 g	PE-HD	Not removable	0 %



© rec Analys

/da	Nome / Projects / R-	Cycle 1857 / Fockages / (F-Cycle) Ducepon Facka	prg.t./.Results		
	Result			Click on a country to view decars	Toplan
		-			1 25
Editor	WATCH A WORD OF	N HOME TO USE THES PAGE		TX.	1 20
iject. ect	Component:	Shampoo Bottle 1		Sieden	1 - 1- 1
	P(-H0		nam y v	Star (St.	ritigen 35 5
nition	Add another laye	(Q) (Man material (Reme) (Adverse (# 16)	Narway	01.24
	Companent	Cap for Shampoo Bottle	Omare - I		the second
Shampoo	· PE-LD	,	11.125 E V	and the second	- Literation
isition ties	 PE-R0 		tas p v		Cons J. M.
tinput	Add another laye				TT T
i k Summary	you and use use	(Q) (@ Main material) (B. Barrier) (Nand Same and Same and Same	T Belarus
	Component	Front Label for Shampo	Lood (v B	- 6 0 V	
hboard	€ PE-LD		0.9 g v	and the second second	Uirane
nagement	🔹 PE-LLD		0.08% # ~	Borgery	Remarks 1
e ruleșets	e inkst.The		0.02% 📕 🛩		2 2 2
	a adh		0.03% 🖉 🗸		Balanta
© rec		Asime / Property / B-Cycle TEST / Packages / (B-	And lowerbox recorded 1.1. weaks		*
nec nec		ine i reletti i echeritti i recella i lee	ford interdent anticident () worker	Othersteamytee	Per details
🖈 Harrie 🖿 Projec	e cts	*	port prantyce resource () / Market and) (if Same) @ Advance) @ re	Click are a country to re	
nt Home	e cts rtica	*		Old as a country to ve	
 m Proper → Analytic 	e cts rtics vet Editor	Add another layer		Clash ser a country to vi	
A Horne Propes 	e cts rtcs vet Editor Project	Add another layer		Old an a connyme	
Home Home France	e cts cts cts cts cts cts cts cts cts cts	Add another layer		Otorecomyon	
R Home Projec /* Analyt Bill Ruless + New P Active Pro	e cts cts cts cts cts cts cts cts cts cts	Add prother taylor Add another companiest		Otoria convey or	
Home Home Home Home Home Home Active Home Active Home Repet De Remet Packages	e cti trica un telefore la consecuencia de la conse	Add another layer Add another component Add another component Constraintly Reg. MACOR		Character of	
Home	e cts rtcs ert Editor Project signampoo	Add ausdre tager Add ausdre composed Add ausdre composed Composed au		Character	
R Store R Store R Store R Store Active Pro R Cycle 11 Project De Ruleset Project De Ruleset Project De Ruleset Project De Ruleset	e cts rtcs ert Editor Project signampoo	Add another layer C Maximum Add another comparent (* concert lawer) * CONCENT *		Commerce	
Hitme H	e cts tros ver latare project sig Dampos el Dampos el plampos el postorn prestorn	Add another layer C Maximum Add another comparent (• costs lawer) (• costs lawer) (• cost		Chine Landress	
Histore Histore Histore Histore Acady Histore Acady Histore Acady Histore Acady Kicycle 11 Project Da Rulesets Packages Sicycle Rockage Comm Fropo Rulese	e cts tris ver falster nijest EST efficiencon efficiencon eng Daempoo enfines postZion pertilipot	Adjunction topol Adjunction topol Adjunction topol Adjunction topol Adjunction topol Adjunction		Chie analysis Sec. 10	
 Bitme Propo Anapa Bitme Anapa Bitme Active Pri Biggine The Bidment B	e cti ttos uri fater	Add mother target Add mother target (a) constrained (a) and and a (b) constrained (a) and and a (c) constrained (c) and a (c			
R Home H Proport H Robert H Rober	e cts tris ver falster nijest EST efficiencon efficiencon eng Daempoo enfines postZion pertilipot	Add mother target Add mother target (a) constrained (a) and and a (b) constrained (a) and and a (c) constrained (c) and a (c			-
 Ritere Propo Anapa Bruen Freen Ritere Receive Prin Receive Prin Receive Prin Receive Principal Science Receiv	e cti ttos uri fater	Add mother target Add mother target (a) constrained (a) and and a (b) constrained (a) and and a (c) constrained (c) and a (c	en internet son andere person internet and a sonor. Tarabier, son a sonor person and a sonor. Tarabier, and an former person and an		-
R Harre Propo Analy R Role Analy R Role Ro	e cts cts cts cts cts cts cts cts cts cts	Addenoise tages of the second			-
R Hores Proposed Here Analysis Here Analysis He	e chi chi nos eri felder eri felder eri felder eri felder prigt i prigt i prig	Added when the part of the constraints of the const			-
Reiner	e cts cts cts cts cts cts cts cts cts cts	Added when the part of the constraints of the const			-
Reiner	e ch ch ch ch ch ch ch ch ch ch ch ch ch c				
Reiner	e ch ch ch ch ch ch ch ch ch ch ch ch ch c	Adventury () () () () () () () () () () () () ()			
Reiner	e ch ch ch ch ch ch ch ch ch ch ch ch ch c	Addrement of the second			
Reiner	e ch ch ch ch ch ch ch ch ch ch ch ch ch c	Adventury () () () () () () () () () () () () ()			



Automatic aggregation of data over the entire packaging unit

Motivation

- Laborious manual documentation of material flows
- Inability to provide accurate productspecific evidence of recycled content
- Meeting additional customer information needs

- Solution

- Batch-level tracking of used materials and recycled content on packaging unit
- Accurate disclosure of the amount of non-recycled plastic per packaging unit
- Specific customer report

Weight Plastic Weight							
AntityComponentTotal PlasticPCRTotal non-PCR Plastic Weight3.500Plastic Containers112,50 kg79,6 %22,95 kg30Cardboard Packaging	Packaging		ycle				/
WeightPlastic Weight.500Plastic Containers112,50 kg79,6 %22,95 kg30Cardboard Packaging							
30Cardboard Packaging26Strapping tape [m]0,41 kg60 %0,16 kg1Wooden pallet11,18kg35,5 %0,76 kg	Quantity	Component		PCR			
30 Packaging 26 Strapping tape [m] 0,41 kg 60 % 0,16 kg 1 Wooden pallet 1 1 Stretch film 1,18kg 35,5 % 0,76 kg	7.500	Plastic Containers	112,50 kg	79,6 %	22,95 kg		
1 Wooden pallet 1 Stretch film 1,18kg 35,5 %	30						
1 Stretch film 1,18kg 35,5 % 0,76 kg	26	Strapping tape [m]	0,41 kg	60 %	0,16 kg		
	1	Wooden pallet					
23,87 kg	1	Stretch film	1,18kg	35,5 %	0,76 kg		
*					23,87 kg	Ŧ	
C∕⊃ R-							R-CI

pro Data



Reduction of one-way tray packaging material in Europe's Green Supply Chain

Euro Plant Tray

Starting Point

- Estimated use of one-way plastic trays p.a. with limited/no recycle systems:
 → 500-700 mio. in Europe
- Wide variety of existing trays make automation of processes nearly impossible
- Existing reusable tray solutions do not fulfil the requirements of the industry and have not achieved market penetration
- Planned CO2 and plastic waste taxation will increase costs of usage for single used trays





Initiative startet in 2021

- Deutsche Umwelt Hilfe e.V. (DUH / NGO) Symposium: "Anything but green? The plastic waste problem in the plant trade"
- Start of project "Flowertray" March 8th 2021
- Participants: ca 80 major players in the European market (mainly DE, NL, DK) of plant production, trade and retail as well as industry connected companies
- Survey with 350 companies in the Green Industry to gain insights about needs, wishes and restrictions for a European standard tray solution

Resulting in:

- Agreed draft criteria for future tray types, operational pool management, financing and roadmap for further steps
- Founding an branche-driven European Cooperative to develop manage and operate the reusable plant tray system in August 2022: Euro Plant Tray eG



Founding the Euro Plant Tray eG Cologne, August 23rd.2023

Grown to 30 Members from six contries while the first Year: Euro Plant Tray eG







Jointly achieved results

- Development of reusable trays:
 - two types of the Normpack 400 series
 - Additional types development ongoing
- Supply Chain test with 40 k samples in Spring 2023
- **Rental Models** and contracts, incl. uniform deposit fee / replacement fee
- Poolmanagement tender ongoing
- **Production** tender ongoing
- Selection of Tools and Software
- Definition of Identification Options
 - GTIN
 - Data Matrix Code
 - RFID
 - Fust Code



EPCIS – successful GS1 & ISO Standard connects multiple Businesses

Business Case



Support for

- Supplier Processes
- Production processes
- Logistics processes
- Store processes: Front- & Backstore
 - Meat and Fish Tracking from Supplier to the POS
- Tobacco Tracking for EU
- Deposit Tracking f
 ür Makro NL
- Electronic Shelf Label Control
- Connected with fTRACE for some use cases
- Connection to EU and national verification systems
 - Manufacturing processes pharmaceutical companies
- Wholesaler logistics processes
- Verification processes hospital pharmacy
- Manufacturing processes Schaeffler
- Wholesaler logistics processes
- Verification processes workshop / service
- REPEXPERT portal solution

Technical Features

- 150 million events p.a.
- live since 2018, Archive solution 10 years
- 600 stores, 5 countries, 14 DCs
- Real-time DB for real-time processes
- Hosting: Private SaaS (Recast IT)
- Hosting: Google Cloud Platform (METRO.digital)
- 100 Mio Events p.a.
- >500 Stores
- Live since 2015
- Kafka adapter for Backend
- Hosting: Microsoft Azure (provided by Arvato)
- 200-500 Mio Events p.a.
- Live seit 2018
- Manufacturing processes Schaeffler
- Wholesaler logistics processes
- Verification processes workshop / service
- REPEXPERT portal solution OR R-Cycle 16







Lessons Learned ...

pro Data

Integration of all value chain partners is necessary to close loops and enable a true circular economy



Standards are critical to facilitating effective communication across value chains



C R-Cycle 17

Lets accelerate your business with R-Cycle DPPs.



Any more questions?



Contact us:

Conrad von Bonin Managing Director EECC vonbonin@eecc.info +49 175 2982091 Dirk Bansemer Managing Director Euro Plant Tray dirk.bansemer@europlanttray.com +49 170 4557178



HARD

Benedikt Brenken Director R-Cycle Benedikt.Brenken@r-cycle.org +49 151 57972132

C>>> R-Cycle