Let’s put now the spotlights on tray to tray recycling

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PET Sheet Europe
An EuPC Sector Group

EUPC

WHO WE ARE

PET Sheet Europe
An EuPC Sector Group

- Since 2016, Pet Sheet Europe is a sector group of EuPC (European Plastics Converters)
- It represents the interests of the PET Film and Sheets producers to the European legislators and other professional organizations
- Study and discuss scientific, technical, economic, regulatory and institutional matters that are of common interest to the members of the sector group
- In cooperation with PETCORE established the Functional Barrier Consortium

WHO WE ARE

- ILPA is an Italian Company Founded in 1962
- Companies/plants 3 (ILIP Srl, MP3 Srl, AMP Recycling Srl). Employes >550
- ILIP -Manufacture trays for Retail, Food industries, tableware
- MP3 -produce semifinished materials for industrial applications automotive, sanitary, and food industry
- AMP recycling- 2 PET recycling lines for a total capacity 55.000 t/year.
  -One Decontamination unit; 4 extrusion lines




Agenda

-A journey to tray to tray recycling

-Post consume thermoformed Trays collection in Italy:
VPET fraction (Corepla)

-Feedstock (bales composition in input to washing line)

-Recycling Process step by step

-Output hot washed flakes

-extrusion/thermoforming characterisation

Conclusions

-Video of AMP tray recycling plant

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A long journey….

It took 6 years from the moment in which ILPA /AMP recycling take up the challenge of studying the post consume PET Tray Recycling

2018 → 2020 → 2022 → 2024 →

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To achieve our goal

Tray to tray recycling an industrial challenge

we work on several aspects

«study and explore different technologies»

«support and collaboration from waste collection Company - COREPLA »

«continuosly invest to improve our recycling process & quality»

«ways to expande our activity and volumes»

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-Post consume thermoformed Trays collection in Italy (Corepla)

Corepla started in 2014 the Trays sorting activity and in 2020 trays bales were sent to selected recycling facility (AMP recycling)

2014	Start of sorting of trays
2016	
2020	In collaboration with Profood, Unionplast, Conai sorting started again
2021-2022	First 4000 tons of trays sent to recyclers
2023	9000 tons of trays
2024	11.000 tons of trays (forecast)

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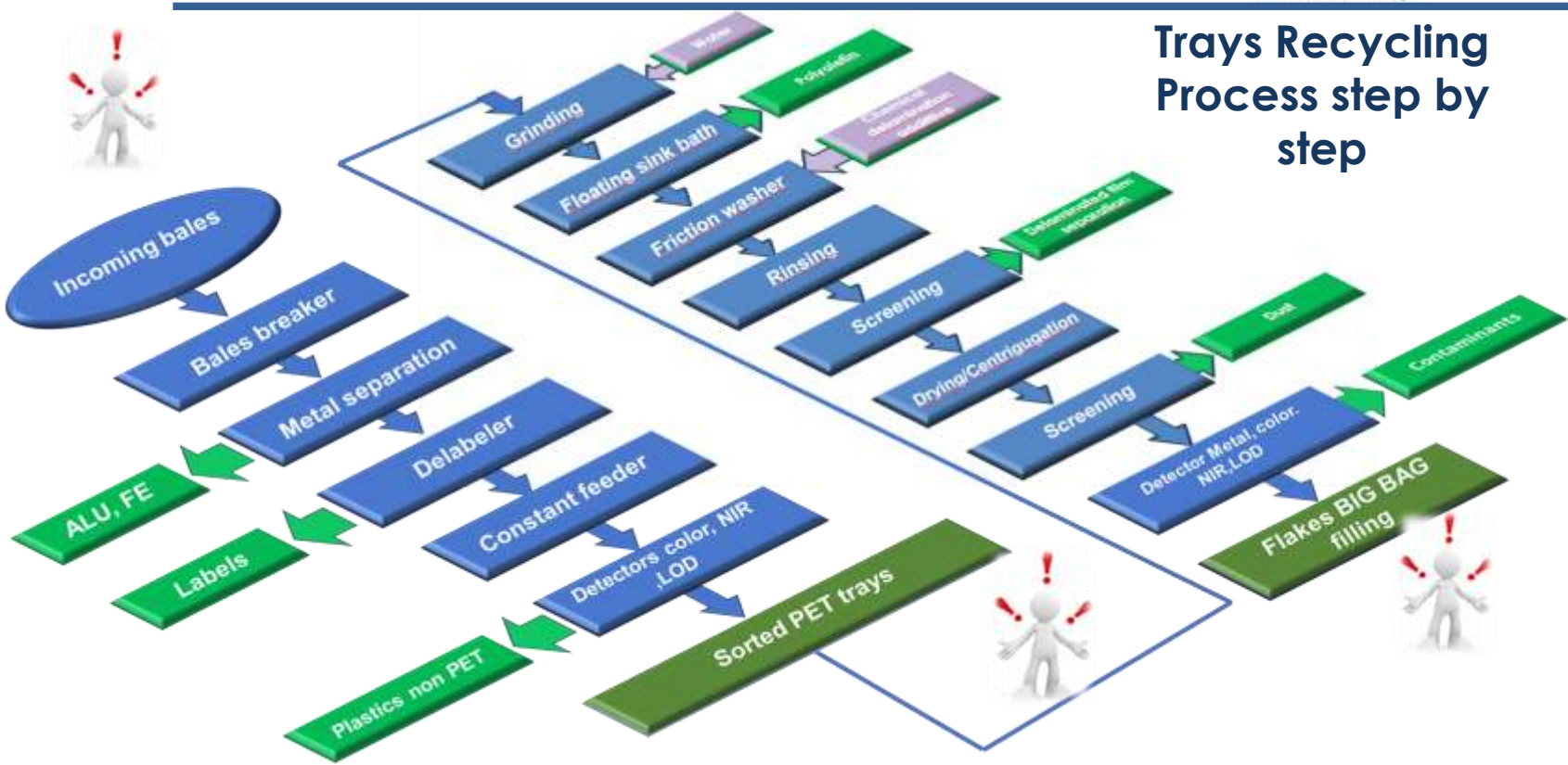
Trays Recycling Process step by step



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-Feedstock (incoming bales)

+ Multilayer PET ⟷ + Mono PET

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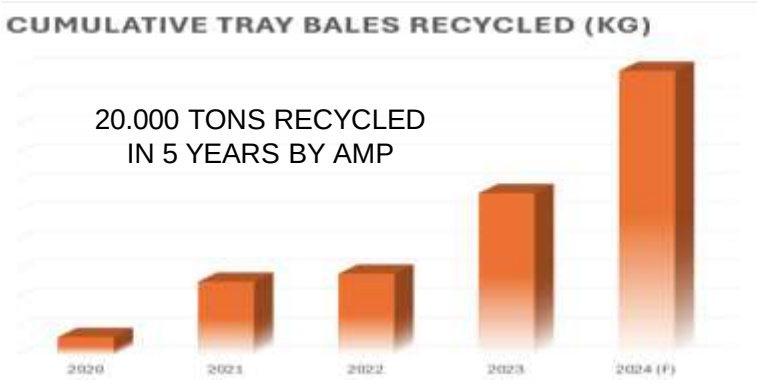
-Feedstock (bales composition)

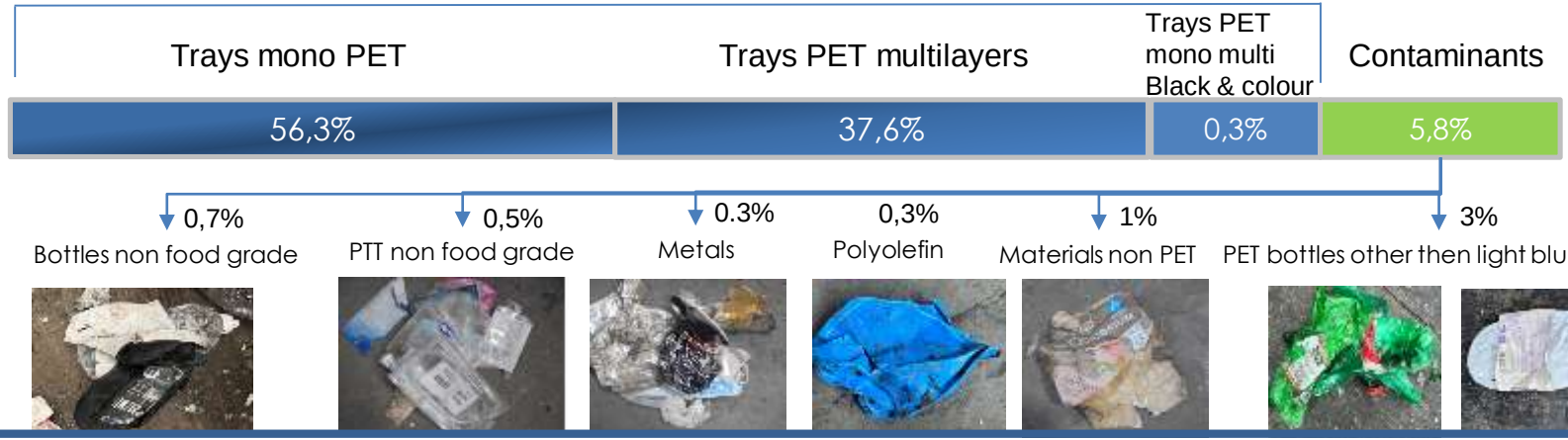


Total PET trays fraction in bales 94.2%

Organic matter higher then bottles

Non food PET materials < 5%

The big challenge: the recovery of PET from Multilayers trays



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Characterisation (2024)	PET trays Flakes		Bottles flakes	
CONTAMINANTS (ppm)	**average**	max	**average**	max
PVC	0,1	6	0,3	4
PS	7	150	0,2	4
Polyolefin	0,2	12	2	20
Other polymers	0,5	18	0	0
Metal Fe	0	0	0	0
Aluminium	2	12	0	0
Cellulose	0,4	24	0	0
PET/G	0,5	28	2	18
PET/PA	100	210	238	400
labels	2	10	6	114
Others plastics materials	5	12	2	13
Total contaminants	118	482	251	573
PET color (ppm)	**274**	3.670	**165**	424
Flakes with glue	**78**	463	**75**	118
Umididy (%)	**0,730**	0,800	0,640	0,710
Organic residue (ppm)	**285**	1.648	**71**	634

-Output -hot washed tray flakes (overview)

Differences vs bottles flakes

-higher organic residue (food contamination)

-higher quantity of polymers not PET

-higher load of color /opaque PET containers

Oven test

Trays flakes poor quality

Trays flakes medium quality

Trays flakes good quality

-Output hot washed Trays flakes (overview)

Differences vs bottles flakes (size distribution)

PARTICLES SIZE FROM TRAYS	≥12.000 µm (%)	≥10.000 µm (%)	≥8.000 µm (%)	≥4.000 µm (%)	≥2.350 µm (%)	≥1.000 µm (%)	<1.000 µm (%)
	0,00	0,00	0,18	29,40	47,80	21,06	0,40

PARTICLES SIZES FROM	≥12.000 µm (%)	≥10.000 µm (%)	≥8.000 µm (%)	≥4.000 µm (%)	≥2.350 µm (%)	≥1.000 µm (%)	<1.000 µm (%)
	0,00	0,00	1,50	71,10	11,50	15,80	0,10

--higher fines formation dues to low thickness of trays and the amorphous nature, are difficult to recover

Extrusion: FB Sheets from trays flakes

sorting	Mono	Mono	Mono	Mono	Reference
Extrusion Configuration	X1	Y2	X1	Y2	X1
Thickness (micron)	340	340	590	590	340
Throughput kg/h	1000	1000	1900	1900	1900
Ratio of B layer %	85	85	85	85	85
bottles flakes light blu %	75	90	90	90	100
Trays PET flakes %	10	10	10	10	
Ratio of A layers %	15	15	15	15	15
Transmittance of batch of trays Pet Flakes used (Xilene estraction)	93,2	93,2	93,2	93,2	96**
Total contaminants (ppm)	82-140	82-140	82-140	82-140	250
PET opaque/white (ppm)	200	200	200	200	200
Organic residue (ppm)	876-912	876-912	876-912	876-912	224
Haze of final RPET sheet	18,6	11,5	23,6	17,4	10

**transmittance of Bottle flakes

-Sorting efficency in recovery mono from multilayers trays impacts on optics

-Viscosity needs to be increased with IV enhancers

-Sheets from Twin screws extruder (Y2) have better haze (better mixing) vs single screw (X1)

-Opacity/haze: (values depend from thickness)

- < 10 Transparent (as per 100% bottles flakes)

- 30-40 Milky

Conclusions

We are eager to have shared with you today, our "efforts" to tame the process of T2T recycling……

….recognizing that there are still some challenges facing it

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