PET Trays recycling trial

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Target

Process a small batch of PET-based trays in order to:

1. check the critical points of the process and;
2. characterize the end product (pellet) to check possible end applications;
3. Draft a cost analysis to check economics

Feedstock

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Sorting

Processed with a Tomra NIR equipment

Input = 1.534 kgs

Rejected = 118 kgs (8%)

Accepted = 1.416 kgs (92%)

Note: we run a second NIR sorting step and the 70% of rejected trays were accepted; yeld should theoretically get to 97-98%

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Washing/grinding

Processed with a Sorema equipment (parameters not to be disclosed in this stage)

Input	=	1.246 kgs
Output (washed flakes)	=	750 kgs (60%)
Waste (floated PO)	=	347 kgs (28%)
Waste (light fraction)	=	78 kgs (6%)

Note:

- **85% of washed flakes were < 4mm. (heavy fraction)**
- **15% were > 4mm. (light fraction)**

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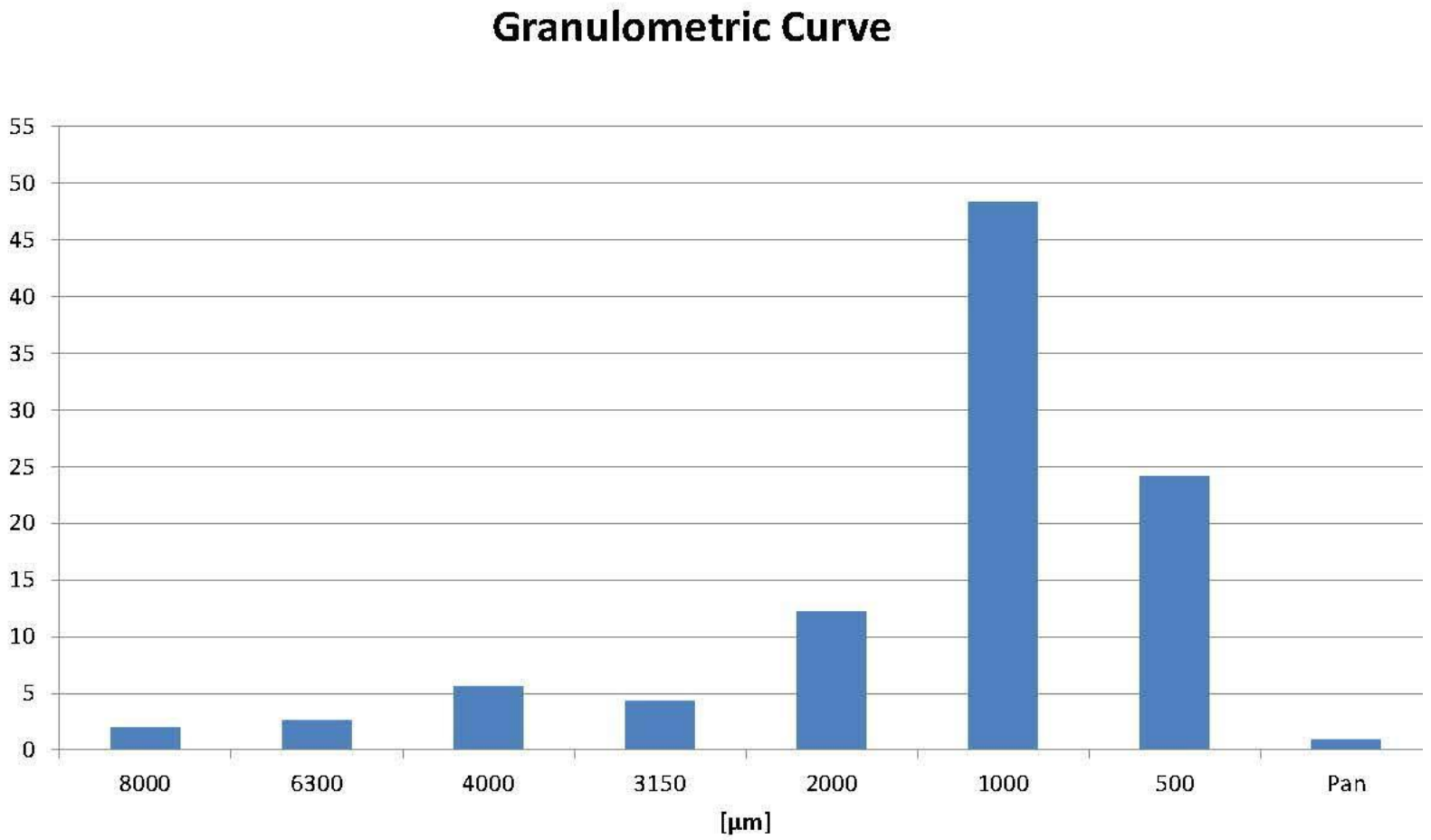
Granulometry



Oven test

	FINES	FLAKES
BEFORE		
AFTER		

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Pelletization

Processed with a Starlinger PET equipment
(parameters not to be disclosed in this stage)

	Pellets before SSP	Pellets after SSP
Fine fraction	0,595 i.V.	0,75 i.V. (205°C - 6 hrs)

Note:

- **SSP step was a simulation to check how the material is reacting to SSP**

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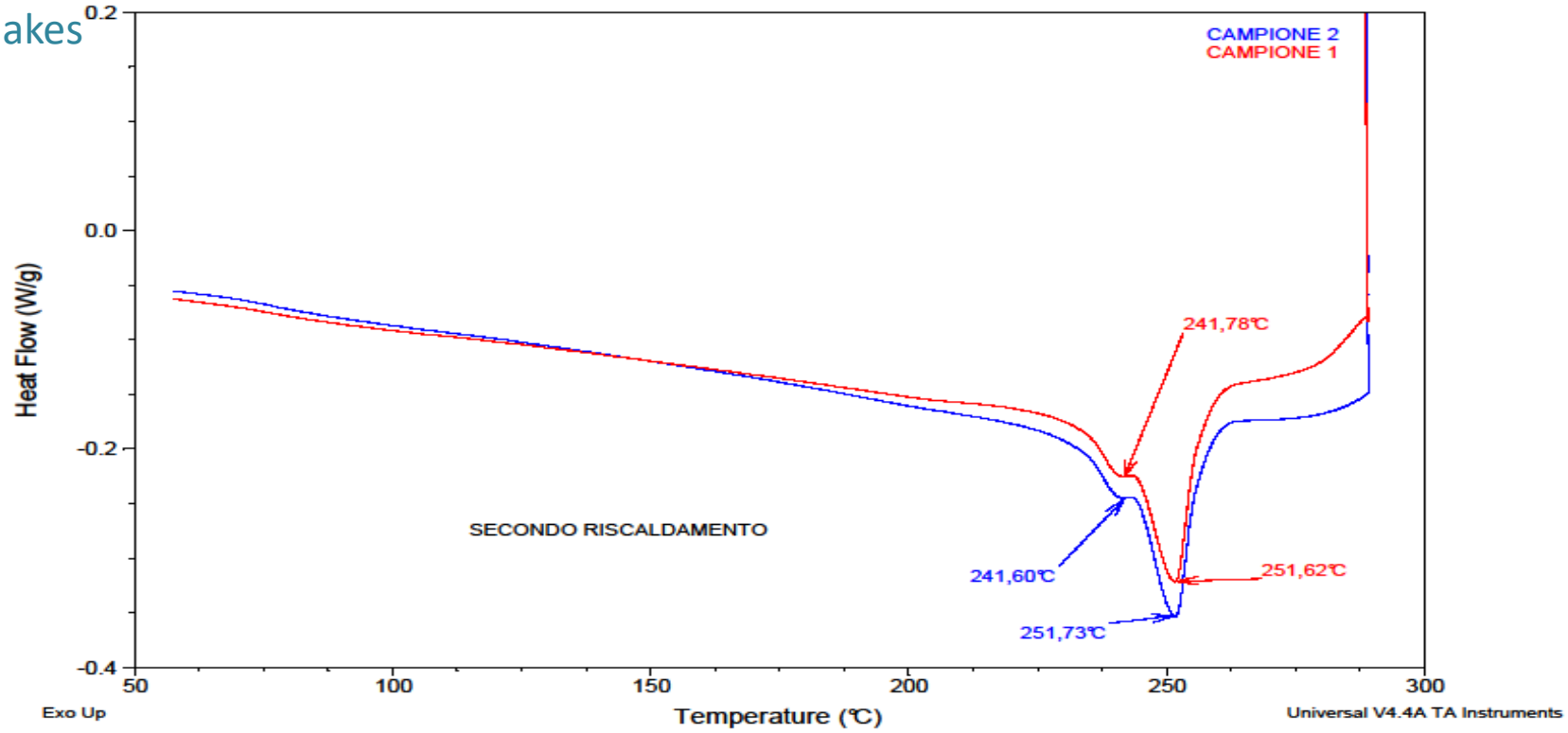
DSC analisys

Red = fines
Blue = flakes



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Economics

Feedstock cost = 0 €/ton

Transport cost = 30 €/ton

Washing/grinding cost = 180 €/ton

Sorting/washing/grinding yeld = 55%

Washed flakes cost = 382 €/ton

Pelletization cost = 120 €/ton

Pelletized rPET cost = 502 €/ton

Note:

- **To be defined disposal cost for waste and water treatment costs**

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Points of discussion

COLLECTION: at what conditions collection schemes are going to start a reliable PET-based tray stream?

SORTING: can NIR improve detection or shall we consider a double sorting step?

RECYCLING: high quantity of fines: how to manage this?

RECYCLING: a test with an higher % of multilayers/multicolors is recommended to better understand the final result

END APPLICATIONS: to be listed and tested

COST: is 500 Eur/ton an affordable cost for potential applications?

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