

RECP Best Practice Catalogue

*Optimisation of PET lines 1 and 2, focusing
on CO₂ and raw material losses*

Developed within the framework of MED TEST II



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



The SwitchMed Programme is
funded by the European Union

Best Practice - Optimisation of PET lines 1 and 2, focusing on CO₂ and raw material losses

SECTOR:	Food & Beverage
SUBSECTOR:	Manufacture of beverages
PRODUCTS	Carbonated beverages; flavoured still beverages; fruit juice beverages in PET and glass bottles
CATEGORY	Process control or modification
APPLICABILITY	Process
COMPANY SIZE	269 employees



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Description of the problem

(Base scenario):

PET lines 1 & 2 work with high CO₂ and raw material losses due to:

1. Technical defects such as wear of the monoblock filler seals
2. Failure of the Chillers resulting in a high temperature of the beverage and a concomitant reduction in CO₂ solubility.
3. Differences in CO₂ content between the filling adjustment and laboratory analysis.
4. Use of CO₂ at 60 °C which does not promote its solubility when mixing with water

Description of the Solution

The improvement measure consists in eliminating the following defects found:

1. Servicing and maintenance of the monoblock filler, in particular the filling heads and their joints.
2. Reconditioning the Chillers.
3. Ensure that CO₂ measurement is performed by an accurate and calibrated analytical instrument. Verify the results obtained from external labs.
4. Tracking the CO₂ content on the PET 2 line when the cooling is working properly.
5. Check the operation of the CO₂ metering device and make sure that the injected quantities comply with the set (programmed) values
6. Use of CO₂ at 15/20 °C instead of 60 °C during its dissolution in water and do this by resizing the liquid CO₂ expansion system

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Economic Benefits

Reduction CO₂ losses by 60%, to 9.16 tons/year or 1,650 €/year
Reduction of sugar losses of 40,219.30 kg/year, or 30% compared to the overall loss which comes to 14,050 €/year
Waste reduction (PET bottles and caps) of 447 kg/year or 2% of PET waste and caps which comes to 560 €/year
Reduction of water consumption by 8%, or 10,000 m³/year, which is 2,025 €/year
Overall savings: 18,285 €/year

Environmental Benefits

Annual reduction in losses of:

- 9.16 tons of CO₂
- 40.2 tons of sugar
- 447 kg of waste (PET bottles and caps)
- Water, 10,000 m³

Health and safety impact

Not relevant



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Capital investments & financial indicators	Cost: € 1,000 (spare parts not included) Return on investment: immediate
Suppliers	Imported measuring instruments spare parts, such as seals: local supplier
Other aspects	Process stabilisation Guarantee of quality and regard for specifications
Implementation	