

Deliverable 3.7

Technical reports on Optimized 100% and 50% PCR-PET Bottles: different colors and bottle design.

The produced preforms with 100% recycled PET (R-PET), 50% R-PET/V-PET and 100% V-PET with different colors, have been blown with traditional blowing machines using different bottle molds, in order to verify the mechanical characteristics of the bottles characterized by different stretch ratios.

In particular, three different bottles design have been selected for the bottle production and characterization, as shown in the following pictures in figures 1-4.

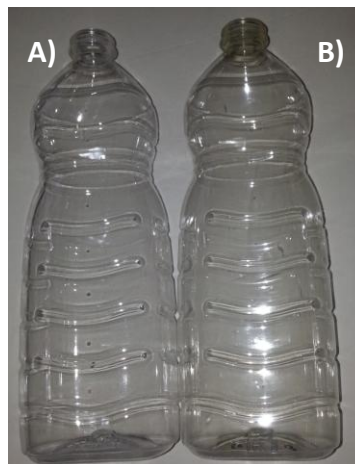


Figure 1. Clear 1 liter bottle for seeds olis (COOP design). A) 31g 100% V-PET bottle; B) 31g 50% R-PET/V-PET bottle.



Figure 2. White 1 liter bottle for seeds oils (DANTE design). A) 31g 100% V-PET bottle; B) 31g 50% R-PET/V-PET bottle; C) 31g 100% R-PET bottles.



Figure 3. Green 1 liter bottle for seeds olis (OLITA design). A) 31g 100% V-PET bottle; B) 31g 50% R-PET/V-PET bottle; C) 31g 100% R-PET bottles.



Figure 4. Red 1 liter bottle for seeds olis (OLITA design). A) 31g 100% V-PET bottle; B) 31g 50% R-PET/V-PET bottle; C) 31g 100% R-PET bottles.

The present report focuses on the production of different 1l bottles using the preforms produced with up to 100% R-PET food grade. In particular, the bottles have been blown with industrial blowing machine by KOSME at Mataluni Spa Company using different molds of bottles, in order to verify the capability of R-PET 31g preforms to be blown in different kind of bottles shapes and therefore changing the stretch ratio between preform and bottles.

The blowing conditions set have been optimized for any kind of preform produced considering both the R-PET content and the colorant used. In particular, the blowing

parameters have been set in order to ensure high production rate and high acceptability of the bottles after a visual inspection.

In the following tables 1-2-3 are summarized the principal blowing process parameters and their relative settings according to the different preforms blown.

Table 1: Optimized Blowing Condition for the different Preforms with 100% V-PET

31g 100% V-PET Preforms	Clear COOP design	White Dante design	Green Olita design	Red Olita design
Pre-Blowing Pressure	9	9	8	8
Blowing Pressure	33	34	34	34
Production rate	5000	4800	5200	5200
Percentage power of IR lamp for heating preforms [%]				
Neck position	90	100	100	100
Upper part of the body	72	85	83	83
Down part of the body	53	60	42	42
Bottom position	65	65	68	68

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Table 2: Optimized Blowing Condition for the different Preforms with 100% R-PET

31g 100% R-PET Preforms	Clear COOP design	White Dante design	Green Olita design	Red Olita design
Pre-Blowing Pressure	9	9	8	8
Blowing Pressure	33	34	34	34
Production rate	5000	5000	5200	5200
Percentage power of IR lamp for heating preforms				
Neck position	85	95	95	95

Upper part of the body	70	85	80	80
Down part of the body	50	60	45	45
Bottom position	60	65	68	68

Table 3: Optimized Blowing Condition for the different Preforms with 50% R-PET/ V-PET

31g 50% R-PET/V-PET Preforms	Clear COOP design	White Dante design	Green Olita design	Red Olita design
Pre-Blowing Pressure	9	9	8	8
Blowing Pressure	34	34	34	34
Production rate	5000	5000	5200	5200
Percentage power of IR lamp for heating preforms				
Neck position	85	95	95	95
Upper part of the body	70	85	80	80
Down part of the body	50	60	45	45
Bottom position	60	65	68	68

The visual inspection of a representative sample of bottles gave positive results as regards the shape of the bottles.

The weight and dimensional characteristics of the produced bottles have shown that all the different bottle typologies show a good material distribution along the bottle side wall and high symmetry between the two sides of the bottle.

However, the detail of physical and mechanical characterization of the above bottles is reported in the Deliverable 4.2.