

2. Technical Data

2.1. Raw Material (PET bottle grade precursor, amorphous)

For the start-up period and the test run, the Buyer shall provide PET bottle grade precursor chips conforming to the following specifications received from Unibax on 18.08.1994.

Polymer

Polyethyleneterephthalate (PET), Copolyester

Pellets geometry

oval shape

average dimensions:

- length approx. 2.5 mm
- diameter (oval) approx. 3.0 x 2.0 mm
- size variance (SD) max. +/- 10 %

Density

- material density approx. 1335 kg/m³ (amorphous product)
- bulk density approx. 800 - 920 kg/m³

Specific heat capacity

- at 100°C 1.465 kJ/kg°K
- at 200°C 1.800 kJ/kg°K

Glas transition point (midpoint)

min. 75 °C

Melting point

- DSC peak temperature min. 257 +/- 2°C

Viscosity (Buhler measuring method)

mean value (I.V.) 0.615 dl/g

range (3SD) ± 0.010 dl/g

<u>Acetaldehyde content</u>	max. 100 ppm by weight
(Buhler measuring method)	
<u>Color (Buhler measuring method)</u>	
b* (with light type D65/10)	max. 0.5
<u>Carboxyl-endgroups</u>	max. 35 mmol/kg
<u>Dust content</u>	max. 0.3% by weight
<u>Feed conditions to crystallizer</u>	
moisture content	max. 0.5 % by weight water
product temperature	min. 10 deg. C. max. 50 deg. C.
<u>Ambient temperature</u>	min. -20 °C max. 35 °C, required at OTWG pellet cooler air inlet

2.2. Guarantee for PET bottle grade chips (final data)

(based on Elana Co-PET with specified initial data)

Viscosity (Buhler measuring method)

mean value (I.V.) min. 0.78 dl/g (at nominal capacity)

range (3SD) ± 0.02 dl/g

Acetaldehyde content (Buhler measuring method)

guaranteed: max. 1.5 ppm by weight

(based on a viscosity enhancement of 0.20 dl/g I.V. units)

b* (with light type D65/10) max. increase 2.00 units

(for a viscosity enhancement of min. 0.20 dl/g I.V. units)

Temperature after cooler 401

max. 60 °C.

Carboxyl-endgroups

max 35 mmol/kg

(for a viscosity enhancement of 0.20 dl/g I.V. units)

Dust content

max. 100 ppm by weight

2.3. Guarantee for capacity and raw material consumption

2.3.1. Capacity

The plant is designed for a production of

$$45 \text{ t/day} = 1875 \text{ kg/hour}$$

bottle grade PET pellets with a final intrinsic viscosity of 0.78 dl/g

The capacity is based on lab results performed with Elana Co-PET tested at Buhler Uzwil.

2.3.2. Raw Material Consumption

For the production of 1,000 kg bottle grade chips the consumption of amorphous raw material will not exceed 1,008 kg material in the steady state. Humidity content of the raw material is max. 0.5%.

The loss of 0.008 kg/kg includes the incoming dust (which is removed significantly in the fluidized bed), the removal of acetaldehyde, the split off of ethylene glycol by the polycondensation reaction, the sublimation of oligomers and water.

2.4. Utilities - Specifications, Consumptions

2.4.1. Electrical power

Power voltage:	220/380 V AC	-10 %
Frequency:	50 Hz	+ 0,5/-1,5 cycles
Phases:	3 PEN	+ neutral is ground
Control voltage:	220 VAC	
Solenoid voltage:	24 V DC	
Alarm / Interlocking voltage:	24 V DC	
Signals:	4-20 mA	

Electrical motors

Installed:	approx. 270 kW
Consumption:	approx. 175 kW

<u>Control system:</u>	approx. 10 kW
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Electrical heater

Installed: 480 KW
 Consumption: 335 KW

Moc zainstalowana 868 kW + 10 kW + 10 kW *oświetl. potn. utasne*

2.4.2. Cooling water

Pressure: 6 bar abs.
 Consumption: 7.6 kg/s
 Max. consumption: 10 kg/s
 Water temperature in: 25°C
 Water temperature out: 35°C

2.4.3. Nitrogen (99.999 %)

Pressure: 5.5 bar abs
 Temperature: ambient
 Dew point: -20°C
 Consumption in operation: 20 Nm³/h

2.4.4. Instrument air

Pressure: 5.5 bar abs
 Temperature: ambient
 Dew point: -20°C

PT-Catalyst

Consumption in operation: 11 Nm³/h
 Consumption max.: 13 Nm³/h

Instruments

Consumption: 20 Nm³/h

2.4.5. Plant air

Pressure:	7 bar abs
Temperature max. [°C]	ambient
Dew point:	-20°C

Takt-Schub conveying system group 500

1. Conveying	from	raw material silo
	to:	pre bin 507
Capacity PET pellets:		2.5 t/h
Consumption, normal operation:		1.98 Nm ³ /min

Takt-Schub conveying system group 700

2. Conveying	from	cooler 401
	to:	Storage silo
Capacity PET pellets:		2 t/h
Consumption, normal operation:		1.98 Nm ³ /min