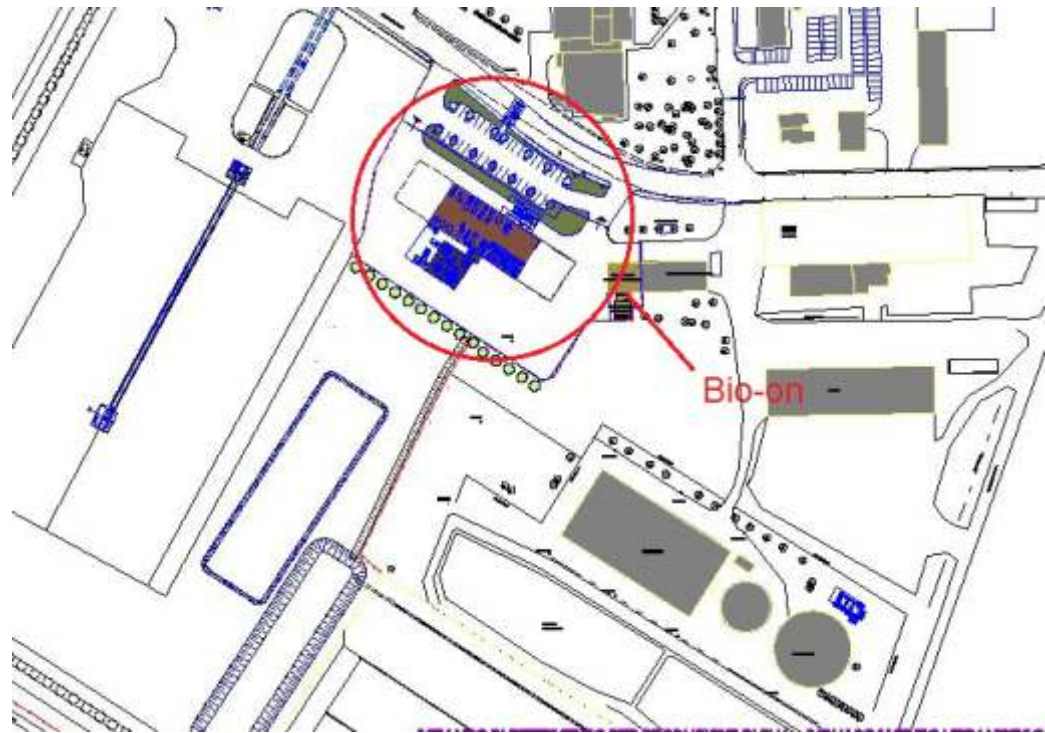
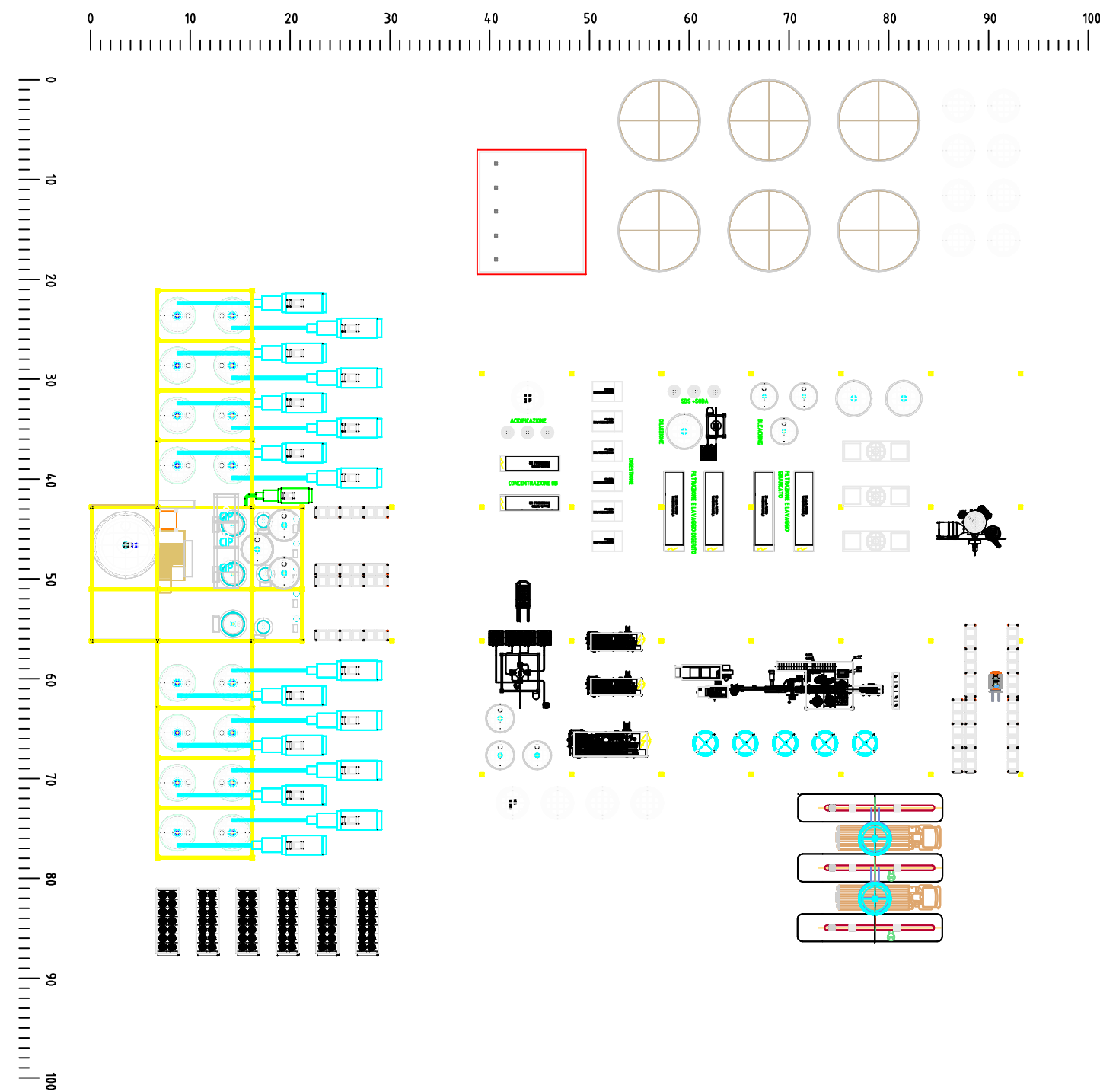
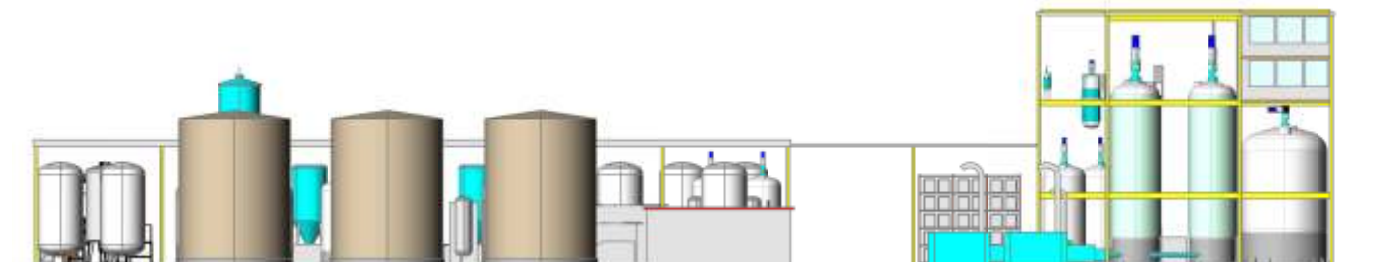
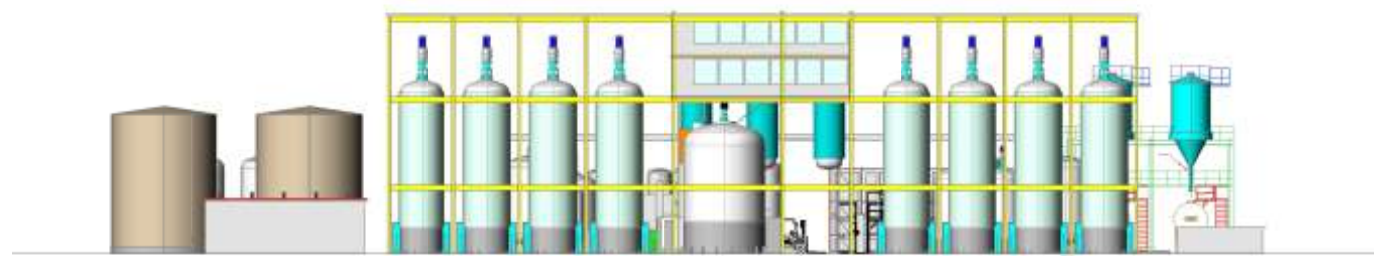


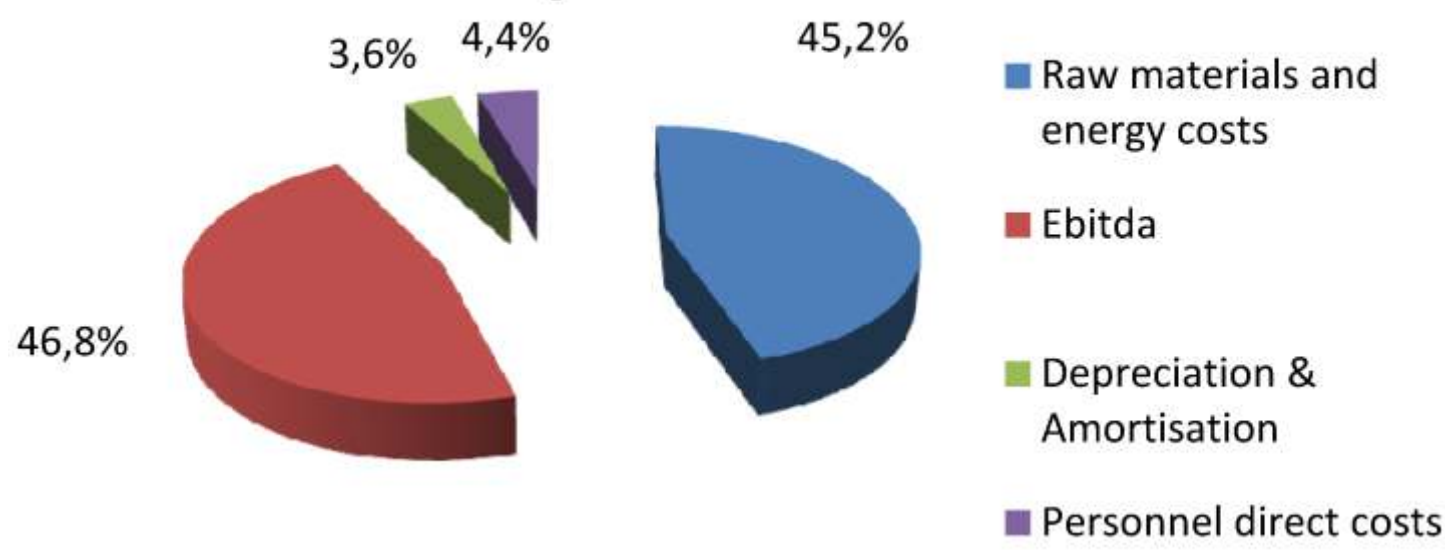


PHB, Poly Hydroxy Butyrate, Technical Data Sheet (white powder)

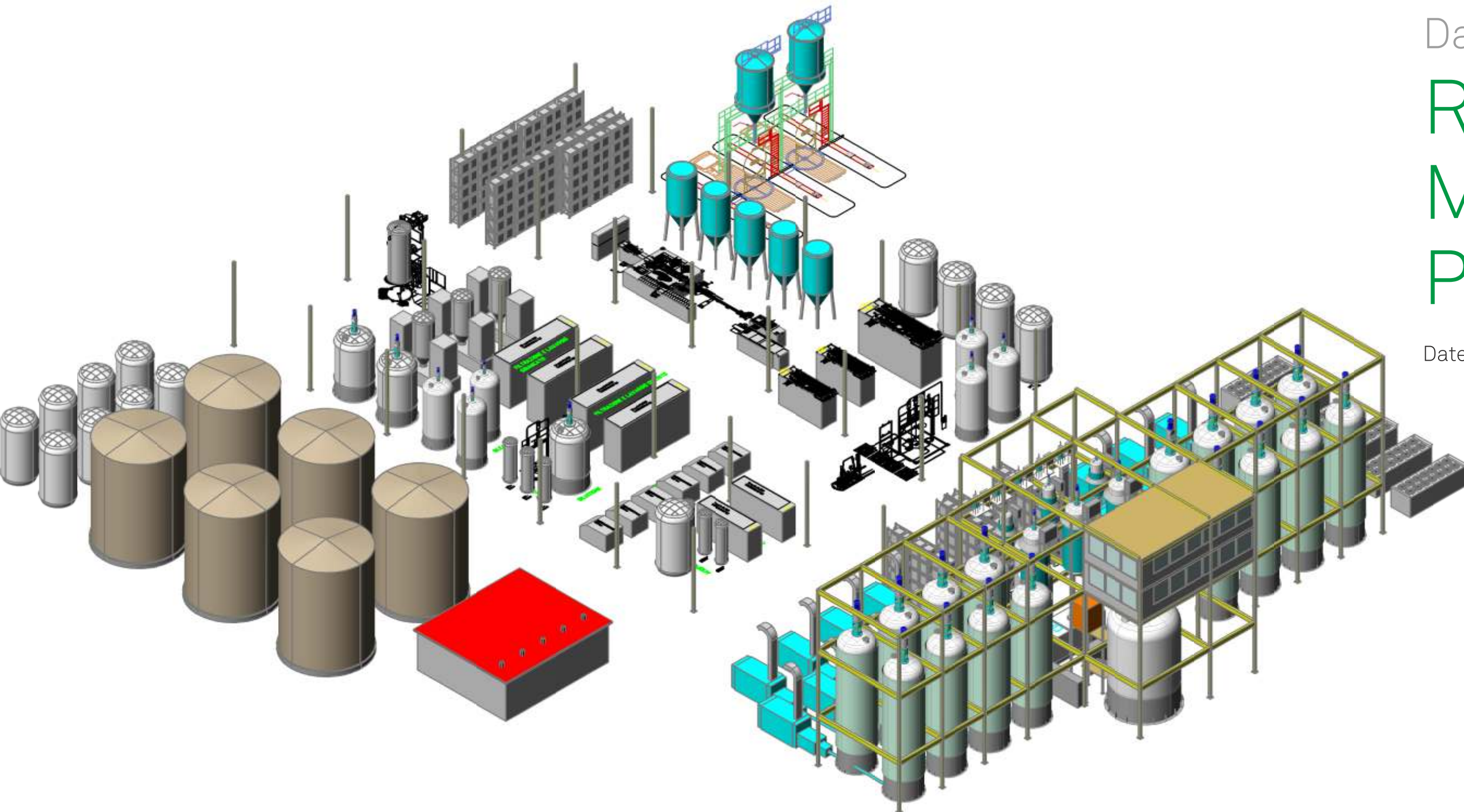
PARAMETER	DATA
Humidity (%)	0.2÷0.8
Titre (%. HPLC)	≥97.0
GPC parameters (polystyrene standard):	
Mw (kDa)	160÷240
Mn (kDa)	70÷120
Colour	White-whitish
Melting temperature (°c)	175±3
Cristallinity (%)	65±5

Dati	Valore
Investimento richiesto	€ 60.000.000
Produzione attesa (Tons/anno)	t/a 10.000
Valore generato (€/anno)	€ 50.000.000
Consumi materie prime	€ 22.000.000
di cui barbabietola	€ 15.000.000
Valore creato (vita impianto = 20 anni)	€ 340.000.000

Revenues repartition



TECHINT Engineering & Construction	Piano Industriale Team
PHAs TECHNOLOGY OWNER Bio-on Bologna	
Engineering & Construction TECHINT Milano	
FERMENTAZIONE Walter Tosto Pescara	OMOGENIZZATORE GEA Parma
FERMENTAZIONE Solaris Mantova	PIPING Techint Milano
AGITAZIONE FERMENTAZIONE Mariotti & Pecini Prato	ESSICAZIONE CRSI-E.NASO Svizzera-Italia
FILTRAZIONE Aeris Mantova	HANDLING IN – HANDLING OUT PIOVAN Padova
STERILIZZAZIONE CFT Rossi e Catelli Parma	ESTRUSIONE PELLET Coperion Germania
ARIA COMPRESSA Aerzen Germania	GESTIONE REFLUI GE Milano (USA)
SCAMBIATORI DI CALORE GE-CFT Milano USA Parma	GESTIONE FLUIDI GE Milano (USA)



Data Sheet

Resin:
MINERV
PHB10

Date 05/03/12

bio-on	Data Sheet	PHB Compound
Resin: MINERV PHB10 Distribution: not commercial Producer: bio-on Via Dante 7/b 40016 San Giorgio di Piano Bologna, Italy Date 05/03/12 Description: Minerv PHB10 is a polyhydroxybutyrate compound fully biodegradable in water, derived from renewable sources and agricultural wastes. This special grade is plasticized and nucleated to create a high potential for replacing the most diffused plastics for injection moulding. Applications: This grade is easy to process with standard injection moulding machines. Special features: fast nucleation for cycle time reduction, thermally stabilized, high flow behaviour, high stiffness. Storage: Minerv PHB10 LIGHT grade resin should be stored in dry conditions. Safety: The product is not classified as a dangerous product and does not contain any additive dangerous for people and the environment. Recycling: The compound is based on a fully biodegradable in water linear polyester. Product scraps and in-house production wastes can be directly recycled after shredding.		

Physical Properties:

property	typical value	unit	test method
density	1,2	g/cm3	
melting temperature	173	°C	DSC
melt flow rate (175 °C/2,16 kg)	23	g/10 min	ISO 1133
tensile modulus (1 min/min)	1,1	GPa	ISO 527
tensile stress at break	20	MPa	ISO 527
elongation at break	3.2	%	ISO 527
hardness, Shore (D scale)	55		ISO 868
volume resistivity	6.2 e+12	Ohm-cm	
Heat distortion temperature (at 1.8MPa)	80.3	°C	ISO 75

bio-on

Data Sheet

PHB Compound

Flame Characteristics:

property	typical value	unit	test method
time to ignition	20.0	s	cone cal.
heat release rate	285	kW/m ²	cone cal.
CO yield	0,011	kg/kg	cone cal.
CO ₂ yield	2.22	kg/kg	cone cal.
total smoke release	230	m ² /m ²	cone cal.
elongation at break	3.2	%	ISO 527
hardness, Shore (D scale)	55		ISO 868
volume resistivity	6.2 e+12	Ohm-cm	
Heat distortion temperature (at 1.8MPa)	80.3	°C	ISO 75

Flame characteristics:

processing parameters	typical value	unit	test method
drying temperature	80	°C	cone cal.
drying time	12	h	cone cal.
melt temperature	175	°C	cone cal.
front zone	170	°C	cone cal.
middie zone	165	°C	cone cal.
rear zone	160	°C	ISO 527
mold temperature	50	°C	ISO 868
holding pressure	300	bar	
injection speed	high		ISO 75