

ValueFlex

Basic Engineering I

Design guidelines



1. Storage capacities

Bale storage sorting line	
Input	50000 t/a
Operational time	6440 h/a
Storage capacity	
Storage period	2 weeks
Production	1000 t/week
Capacity required	2000 t
Basis for storage design	KLR ^{*1}
Bale dimension (HxWxL)	0,8m x 1,1m x 1,2m
No. of bales stacked (max.)	5
Specific stack weight	1,70 t/m ²
Net storage area	1200 m ²
Driveways / fire safety factor	0,5
Required total area for storage	1800 m ²

*KLR: German directive on storing plastic material in terms of fire protection.

Intermediate storage								
Storage period	6 shifts (weekend production of the washing line)							
Production	50 t/shift							
Capacity required	300 t							
	Bulk density	Compartment Volume based on 3D-Layout	Base case		+50% PP		+100% PP	
			Production	Volume	Production	Volume	Production	Volume
PE-natural	100 kg/m³	1440 m³	54	543 m³	50	499 m³	45	455 m³
PE-flex	100 kg/m³	1440 m³	116	1162 m³	108	1083 m³	100	1003 m³
PP-film	100 kg/m³	864 m³	27	266 m³	39	390 m³	51	514 m³
Total		3744 m³	1971 m³		1971 m³		1972 m³	

Buffer Extrusion						
	Bulk density		Buffer volume		Tonnage	
PE-natural	50 kg/m ³		100 m ³		5 t	
PE-flex	50 kg/m ³		100 m ³		5 t	
PP-film	50 kg/m ³		100 m ³		5 t	
	Base case		+50% PP		+100% PP	
	Production	Buffer time	Production	Buffer time	Production	Buffer time
PE-natural	0,96 t/h	5,2 h	0,88 t/h	5,7 h	0,80 t/h	6,2 h
PE-flex	2,05 t/h	2,4 h	1,91 t/h	2,6 h	1,77 t/h	2,8 h
PP-film	0,47 t/h	10,7 h	0,69 t/h	7,3 h	0,91 t/h	5,5 h

1. Storage capacities

Silo storage (Output)										
Storage period	6 shifts (weekend production of the washing line)									
Bulk density Granulate	0,55 t/m ³									
	Base case			+50% PP			+100% PP			No. of Silos (100 m ³)
	Production	Volume		Production	Volume		Production	Volume		
PE-natural	0,9 t/h	45,1 t	82 m ³	0,9 t/h	41,4 t	75 m ³	0,8 t/h	37,7 t	69 m ³	1
PE-flex	2,0 t/h	96,5 t	175 m ³	1,9 t/h	89,9 t	163 m ³	1,7 t/h	83,3 t	151 m ³	2
PP-film	0,5 t/h	22,1 t	40 m ³	0,7 t/h	32,4 t	59 m ³	0,9 t/h	42,6 t	78 m ³	1

Big Bag storage (Output)										
Storage period	6 shifts (weekend production of the washing line)									
Bulk density Granulate	0,55 t/m ³									
Amount of production stored in	30%									
Big Bag specifics	2 m ² /BB			1,1 t/BB			1,3 m ² /BB			
	Base case			+50% PP			+100% PP			
	Production	Area		Production	Area		Production	Area		
PE-natural	0,9 t/h	13,5 t	16,0 m ³	0,9 t/h	12,4 t	14,7 m ³	0,8 t/h	11,3 t	13,4 m ³	
PE-flex	2,0 t/h	28,9 t	34,2 m ³	1,9 t/h	27,0 t	31,9 m ³	1,7 t/h	25,0 t	29,5 m ³	
PP-film	0,5 t/h	6,6 t	7,8 m ³	0,7 t/h	9,7 t	11,5 m ³	0,9 t/h	12,8 t	15,1 m ³	
Net area	58,0 m ²			58,0 m ²			58,0 m ²			
Driveways / fire safety factor	50%			50%			50%			
Total area demand	87,0 m²			87,0 m²			87,0 m²			

2. Operational concept

Sorting line		
5 shift-model, 7 days a week		
Number of weeks	50 weeks/year	
Number of shifts	20 shifts/week	
Maintenance	1 shifts/week	
Shift duration	8,0 hours/shift	8.000 hours/year
Break time	1,0 hours/shift	1.000 hours/year
Production time	7.000 hours/year	
Technical availability ^{*1}	92,0 %	
Production time net	6.440 hours/year	

Reprocessing line		
5 shift-model, 7 days a week		
Number of weeks	50 weeks/year	
Number of shifts	20 shifts/week	
Maintenance	1 shifts/week	
Shift duration	8,0 hours/shift	
Production time	8.000 hours/year	
Technical availability ^{*1}	85,0 %	
Production time net	6.800 hours/year	

^{*1} The technical availability reflects downtime caused by the machinery itself. Maintenance and break times are taken into consideration in the production time.

3. Capacities

Design capacities						
Output sorting line	Basic balance		+50% PP		+100% PP	
PE film nat	9057 t/a		8317 t/a		7578 t/a	
PE flex	19367 t/a		18046 t/a		16724 t/a	
PP film	4429 t/a		6495 t/a		8561 t/a	
Operational time washing line	6800 h/a					
Input capacity Washing lines						
PE film nat	1,3 t/h		1,2 t/h		1,1 t/h	
PE flex	2,8 t/h		2,7 t/h		2,5 t/h	
PP film	0,7 t/h		1,0 t/h		1,3 t/h	
Capacity washing lines (min. - max.) from supplier side	D1 : 1 - 1,2 t/h		D2 : 1,2 - 1,5 t/h		D3 : 1,5 - 1,8 t/h	
Design	Line design	Red Flag	Line design	Red Flag	Line design	Red Flag
PE film nat	1 * D3	74%	1 * D3	68%	1 * D3	62%
PE flex	2 * D3	79%	2 * D3	74%	2 * D3	68%
PP film	1 * D3	36%	1 * D3	53%	1 * D3	70%
Estimated yield washing lines	72%					
Input capacity Extrusion lines						
PE film nat	1,0 t/h		0,9 t/h		0,8 t/h	
PE flex	2,1 t/h		1,9 t/h		1,8 t/h	
PP film	0,5 t/h		0,7 t/h		0,9 t/h	