Available online at: http://publikasi.mercubuana.ac.id/index.php/ijiem

IJIEM (Indonesian Journal of Industrial Engineering & Management)

ISSN (Print) : 2614-7327 ISSN (Online) : 2745-9063



Inventory Planning and Control on Packaging Raw Materials in the Bottled Drinking Water Business (AMDK) PT XYZ Samarinda City

Muhammad Wahyudi^{*}, Wahyuda, Farida Djumiati Sitania

Industrial Engineering, Mulawarman University, Jalan Sambaliung No.9, Samarinda City 75119 Indonesia

ARTICLE INFORMATION

Article history:

MERCU BUANA

Received: 17 October 2023 Revised: 20 December 2023 Accepted: 10 March 2024

Category: Research paper

Keywords: Inventory Bottle drinking water Packaging raw materials Material requirement planning DOI: 10.22441/ijiem.v5i3.23691

ABSTRACT

The production of bottled drinking water (AMDK) has growth of 10.4% from 2010 to 2019. One of the AMDK companies located in Samarinda City is PT XYZ. The produced product is water packaged in 220 ml glass containers. The raw materials for the 220 ml water packaging product include cups, cup lids, straws, cardboard boxes, and cardboard dividers. The AMDK business operated by PT XYZ has only been in operation since 2021, and there is currently no inventory planning and control for the raw materials used in the packaging of the 220 ml AMDK product. This has resulted in a lack of packaging raw material inventory, thus hindering the AMDK production process in the company. Based on this issue, this research is conducted to plan and control the inventory of 220 ml water packaging raw materials at PT XYZ, in order to optimize inventory costs and meet consumer demand for AMDK. Inventory planning and control are carried out using the Material Requirement Planning (MRP) method, and the method used to determine the lot size is the Economic Order Quantity (EOQ) method with shipping capacity constraints. Based on the data processing conducted, the optimal order quantities using the EOQ method with shipping capacity constraints for each packaging raw material are 15.000 pieces for cardboard and cardboard dividers with an inventory cost of IDR 267.112.900. 1.500.000 pieces for straws with an inventory cost of IDR 46.831.630. 540.000 pieces for cups with an inventory cost of IDR 232.026.718. 150 rolls for cup lids with an inventory cost of IDR 87.125.910. The total inventory cost for packaging raw materials for 220 ml AMDK cups is IDR 633.097.158.

*Corresponding Author Muhammad Wahyudi E-mail: mw.yudi264@gmail.com



1. INTRODUCTION

Water is the most important natural resource for living things after oxygen. The human body requires a daily water consumption of 1 to 2.5 liters, and this requirement varies depending on physical activity, body weight, age, climate, and diet (Ministry of Health, 2023). The AMDK or bottled drinking water is water that is packaged and processed without food ingredients or food additives, making it safe to drink (Ministry of

How to Cite: Wahyudi, M., Wahyuda, W., & Sitania, F. D. (2024). Inventory Planning and Control on Packaging Raw Materials in The Bottled Drinking Water Business (AMDK) PT XYZ Samarinda City. *IJIEM (Indonesian Journal of Industrial Engineering & Management)*, 5(3), 752-769. https://doi.org/10.22441/ijiem.v5i3.23691 Industry, 2011). The rapid population growth is directly proportional to the demand for bottled water. AMDK is chosen because it is not only practical and hygienic but also can be consumed anytime and anywhere (Refangga et al., 2018). The AMDK industry has a market share of 85% compared to other beverage industry groups, where there are more than 2000 AMDK brands and 900 AMDK industry companies in Indonesia (Ministry of Industry, 2019). AMDK production volume increased at an average growth rate of 10.4% annually from 2010 to 2019 with an AMDK production volume in 2019 of 29.6 billion liters (Aspadin, 2021). PT XYZ is one of the companies engaged in the AMDK business. The results of AMDK production at PT XYZ are in the form of gallon bottled water and 220 ml glass packaging. Packaging raw materials used in the production of 220 ml glass bottled water at PT XYZ are cardboard boxes, cardboard dividers, straws, cups and lid cups. One box of 220 ml bottled water consists of one cardboard box, one cardboard divider, 48 220 ml glass bottled water and 48 straws. Bottled water raw materials must be stored properly so that the quality of production is in accordance with the established quality standards. AMDK packaging raw materials must be stored in a clean place with a cool room temperature and avoid direct sunlight exposure and kept away from sharp smelling objects.

PT XYZ is a new company in the bottled drinking water (AMDK) industry. The planning and control of AMDK packaging raw materials at PT XYZ follow the minimum order quantities set by the supplier. The phenomena at PT XYZ are often results in shortages of raw materials. As a result, in the days leading up to the arrival of ordered AMDK packaging raw materials, PT XYZ must reduce its daily production to ensure the continuous production process. These inventory shortages of AMDK packaging raw materials can lead to delays in the production process, impacting the ability to meet consumer Therefore, the availability demand. of packaging raw material supplies at PT XYZ significantly affects the smooth production process. One method that can be used to perform inventory planning is the Material Requirement Planning (MRP) method. According to Utama et al. (2019), MRP is a method used to solve problems related to determining the number of parts, components and materials needed to produce the final product. The MRP system also provides detailed scheduling of when each component, material and part should be ordered or produced. The MRP process starts from the netting stage, which is the process of calculating net requirements, then the lotting stage, which is the process of determining the amount of packaging raw material orders, then the offsetting stage, which is the process of determining the right time to order packaging raw materials and finally the explosion stage, which is the stage of calculating the gross needs of items that are at the lower level.

2. LITERATURE REVIEW

Inventory is an asset that comprises goods owned by the company intended for sale, goods in various stages of the production process, and raw materials awaiting processing in the production pipeline (Vikaliana et al., 2020). According to Sipper and Bulfin (1995) in Eunike et al. (2017), one of the variability test techniques that can analyze demand data patterns is to use the Peterson-Silver Rule technique. According to Aritantia et al. (2018), the nature of demand consists of static and dynamic which is measured by looking at the demand variability coefficient. Demand will be said to be static if the variability value V < 0.25and is said to be dynamic if the variability value $V \ge 0.25$. Silver and Peterson suggested that when the variability value V < 0.25, lot sizing calculations can use the Economic Order Quantity (EOO) method, while if the variability value $V \ge 0.25$, lot sizing calculations can use dynamic lot sizing.

MRP or Material Requirements Planning is an information system that utilizes interrelationships plan and control to manufacturing operations. It involves the calculations necessary to determine the components required for the final product and is a technique for establishing the quantity and timing of dependent demand items to fulfill the master production schedule requirements (Kadim, 2017). According to Eunike et al. (2018), the four basic steps in MRP processing are as follows: (1) Netting (calculation of net requirements). Net requirements (NR) are

calculated as the value of gross requirements (GR) minus scheduled receipts (SR) minus inventory on hand (OHI). Net requirements are considered zero when NR is less than or equal to zero, (2) Lotting (lot size determination). This step aims to determine the optimal individual order size based on the results of the net requirements calculation. This step is determined based on appropriate lotting or lot sizing techniques. The parameters used are usually storage costs and ordering costs, (3) Offsetting (determination of order size). This step aims to ensure that the item needs can be available exactly when needed by calculating the lead time for procuring the component, (4) Explosion This step is the process of calculating gross requirements for the item (component) level at a lower level than the available product structure.

MRP requires three essential information inputs, which are as follows: (1) Master Production Schedules (MPS): MPS is a planning phase that determines the quantity and timing for producing each end product. It divides the overall production plan into various end products based on forecast results. MPS is an allocation process that considers the company's capacity to produce the desired products, (2) Product Structure (Bill of Materials - BOM): A BOM is a list of items required to assemble a unit of the finished product. It includes a comprehensive description of the product, not only listing raw materials and components but also outlining the production sequences. The BOM is sometimes referred to as a product structure tree because it illustrates how a product is constructed from its components. This structure specifies the quantities of each item and the order of assembly. When entered into the master BOM. it details all component names, identification numbers, drawing numbers, and material sources, whether produced in-house or purchased externally. The list of components will be assembled, making the master BOM a form of processing, (3) Inventory Records File: This file maintains a record of items in the warehouse and items that have been ordered but not yet received. It is used when needed in production. The contents of this record include identification numbers, available quantities, safety stock levels, planned production

quantities, and procurement lead times for each item. Keeping this record up to date is essential by recording transactions such as receipts, expenditures, defective products, and orders to prevent planning errors (Eunike et al., 2018).

One method commonly used in inventory management is the Economic Order Quantity (EOQ) method. The EOQ method is an approach that seeks to optimize inventory levels by considering factors such as ordering costs and storage costs (Aprilia et al., 2018). The research using the Material Requirements Planning (MRP) method to solve inventory problems has been conducted previously, as seen in studies by Assifa and Pujiyanto (2022), Silfiani et al. (2021), and Setiawan et al. (2020). However, in the current research, there is also a difference in the lotting calculation compared to previous studies. The present study employs the Economic Order Quantity (EOQ) method with shipping capacity constraints, similar to the approach taken in the research by Mubin et al. (2021).

3. RESEARCH METHOD

This research was conducted at PT XYZ, a company specializing in the bottled water industry. The research process began with a preliminary study, followed by data collection through observations and interviews to gather the necessary information. Subsequently, data processing was performed for the purpose of planning and inventory control of raw materials used in the production of 220 ml bottled water. The data collection phase aligned with research requirements, encompassing primary data such as dimensions for each raw material of the 220 ml bottled water, and secondary data consisting of demand patterns for 220 ml bottled water products over the last 12 months, product component data, pricing information for each raw material, ordering costs, storage costs, inventory lists, lead times for each raw material, and storage warehouse dimensions for packaging materials.

Data processing included demand forecasting for the 220 ml bottled water products, involving the creation of demand data plots, identification of demand patterns, and utilization of forecasting methods matching these patterns with minimal error values. Following this, the Master Production Schedule (MPS) was determined based on the forecasted demand for the 220 ml bottled water products, and a Bill of Materials (BOM) was established using the component data for these products. Subsequently, the Material Requirements Planning (MRP) process commenced with the netting stage, followed by lotting, offsetting, and explosion processes. During the lotting applied. stage, the EOQ method was considering constraints capacity for determining the lot sizes of individual 220 ml bottled water raw materials. Finally, the total inventory costs were calculated, and the results of the data processing conducted earlier were analyzed.

4. RESULT AND DISCUSSION

Data Collection

PT XYZ is one of the companies engaged in the bottled water industry with production results in the form of 220 ml glass packaging and gallon packaging. AMDK gallon packaging has been produced since 2021 while AMDK 220 ml packaging has been produced since 2022. The following is the demand data for 220 ml bottled AMDK products for one year, namely July 2022 to June 2023.

	Table 1. Product demand (box)			
No	Month	Demand		
1	July 2022	10.123		
2	August 2022	5.798		
3	September 2022	6.914		
4	October 2022	7.604		
5	November 2022	5.371		
6	December 2022	6.227		
7	January 2023	6.069		
8	February 2023	3.988		
9	March 2023	6.518		
10	April 2023	3.799		
11	May 2023	6.230		
12	June 2023	4.066		
	Total	72.707		
	Average	6.059		

Based on Table 1. Above, it is known that the total demand for 220 ml bottled water products for 1 year is 72,707 boxes with an average monthly demand of 6,059 boxes. Furthermore, data on the dimensions of the storage warehouse and the dimensions of the packaging raw materials from observations and interviews are obtained which will be used to determine the storage cost of each 220 ml bottled bottled raw material.

Table 2. Dimension of strogae warehouse and packaging raw n	naterials
---	-----------

No	Description	Amount	Size(m)	Volume(m ³)	Volume (m ³)/unit
1	Storage warehouse	1	17x10x3	510	
2	Cardboard	1	0,571x0,421x0,007	0,001683	0,001683
3	Cardboard divider	1	0,338x0,219x0,003	0,00022	0,00022
4	Cup	3.600 pcs	0,35x0,25x0,33	0,02475	0,000006875
5	Lid cup	1 roll	0,23x0,23x0,40	0,02116	0,02116
6	Straw	96.000 pcs	0,5x0,5x1	0,25	0,0000026042

Inventory Record Data

Inventory records are one of the inputs to the MRP process and consist of both owned inventory and inventory on order. The following is the inventory data for raw materials for 220 ml bottled water products.

Table 3	Inventory	in	storage	warehouse	
Table 5.	mventory	111	storage	warenouse	

Lusie et miteriory mistorage warenouse			
Description	Inventory	Lead Time	
220 ml AMDK product	18 box	0 week	
Cardboard	4.680 pcs	2 week	
Cardboard divider	4.680 pcs	2 week	
220 ml bottled water	25 pcs	0 week	
Straw	366.000 pcs	2 week	
Cup	126.000 pcs	2 week	
Lid Cup	32 roll	2 week	

In addition to data on the inventory of packaging raw materials in the storage warehouse, there are packaging raw materials that are being ordered. The following is the order data for packaging raw materials for 220 ml bottled water products.

Table 4. Purchase order				
Detail	Date of Order	Order Quantity		
Cup	30 June 2023	540.000 pcs		

Table 4 it is noted that on June 30, 2023, PT XYZ placed an order for 540,000 pieces of cup packaging materials, which are expected to arrive two weeks after the order placement.

The Bill of Materials (BOM) is a list of raw material items required to produce a single unit of a finished product. The bottled water product structure includes finished products, packaging raw materials, and the main raw material, which is water. Here is the product structure for 220 ml bottled water.

	Table 5. Product structure				
Part Number	Component	Component Level	Description	Component Usage	
	Number	Number	1		
	WTR-001	0	220 ml AMDK product	1 box	
WTR -001	WTR -111	1	Cardboard	1 pcs	
WTR -001	WTR -112	1	Cardboard divider	1 pcs	
WTR -001	WTR -113	1	220 ml bottled water	48 pcs	
WTR -001	WTR -114	1	Straw	48 pcs	
WTR -113	WTR -211	2	Cup	1 pcs	
WTR -113	WTR -212	2	Water	220 ml	
WTR -113	WTR -213	2	Lid Cup	1 pcs	

Based on Table 5. above, it is evident that to produce a single item at level 0, which is the 220 ml bottled water product, the following components are required at level 1 is 1 piece of cardboard, 1 piece of cardboard divider, 48 pieces of 220 ml bottled water, and 48 pieces of straws. Moving to level 2, the components for items at level 1 consist of 1 cups and 1 lid cup to create the 220 ml bottled water.

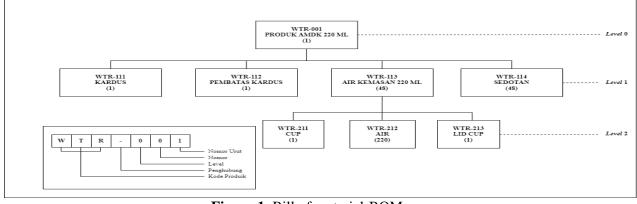


Figure 1. Bill of material-BOM

Ordering Cost

Ordering costs are costs that must be incurred by the Company every time it orders packaging raw materials. Ordering costs are obtained from the total cost of the message plus the shipping costs for each delivery capacity limit. The following is a breakdown of the cost of ordering 220 ml bottled raw materials.

Table 6. Order cost					
No	Description	Amount	Cost	Unit	Cost/order
1	Telephone cost				
	a. Telephone to supplier	5 minutes	IDR 699	/30second	IDR 6.990
	b. Telephone to expedition	5 minutes	IDR 699	/30second	IDR 6.990
2	Administrative cost (making purchase orde	er)			
	a. A4 Paper (Sinar dunia 70 Gr)	1 sheet	IDR 57.140	1 rim	IDR 114,28
	b. Printer ink (Epson E664)	1 sheet	IDR 109.000	1 bottle	IDR 36,33
Tota	1				IDR 14.130,61

In addition to the cost of the message, there is the cost of shipping packaging raw materials. The following is a breakdown of the cost of shipping raw materials for 220 ml bottled water.

Table 7. Shipping cost of pack	aging raw mat	erials
--------------------------------	---------------	--------

No	Description	Cost
1	Cardboard and cardboard	
1	divider	
	a. 12.000 pcs capacity	IDR 8.500.000
	b. 15.000 pcs capacity	IDR 10.000.000
	c. 18.000 pcs capacity	IDR 11.500.000
2	Cup	-
3	Lid Cup	
	a. 50 roll capacity	IDR 2.000.000
	b. 100 roll capacity	IDR 3.500.000
	c. 150 roll capacity	IDR 5.000.000

4 Straw

a. 600.000 pcs capacity	IDR 2.500.000
b. 1.000.000 pcs capacity	IDR 4.000.000
c. 1.500.000 pcs capacity	IDR 5.500.000

From the data on order costs and shipping costs, the cost of ordering packaging raw materials is then obtained from the summation of order costs and shipping costs.

		Table 8. Ordering co	ost	
No	Description	Order cost	Shipping cost	Ordering cost
1	Cardboard and cardboard divider			
	a. 12.000 pcs capacity	IDR 14.130,61	IDR 8.500.000	IDR 8.514.130,61
	b. 15.000 pcs capacity	IDR 14.130,61	IDR 10.000.000	IDR 10.014.130,61
	c. 18.000 pcs capacity	IDR 14.130,61	IDR 11.500.000	IDR 11.514.130,61
2	Cup	IDR 7.140,61	-	IDR 7.140,61
3	Lid Cup			
	a. 50 roll capacity	IDR 14.130,61	IDR 2.000.000	IDR 2.014.130,61
	b. 100 roll capacity	IDR 14.130,61	IDR 3.500.000	IDR 3.514.130,61
	c. 150 roll capacity	IDR 14.130,61	IDR 5.000.000	IDR 5.014.130,61
4	Straw			
	a. 600.000 pcs capacity	IDR 14.130,61	IDR 2.500.000	IDR 2.514.130,61
	b. 1.000.000 pcs capacity	IDR 14.130,61	IDR 4.000.000	IDR 4.014.130,61
	c. 1.500.000 pcs capacity	IDR 14.130,61	IDR 5.500.000	IDR 5.514.130,61

Holding Cost

Holding costs are costs incurred by the Company related to the storage of packaging

raw materials. The following is a breakdown of the holding cost 220 ml bottled raw materials.

			Table 9. Hol	ding cost		
No	Description	Amount	Unit	Cost per unit	Cost per day	Cost per year
1	Electricity cost					
	a. 6 Fluorescent lamp (24 hour per day @32 watt)	4,608	kWh	IDR 1.444,70	IDR 6.657,18	IDR 2.429.869,82
	b. 2 Exhaust Fan (24 hour per day @36 watt)	1,728	kWh	IDR 1.444,70	IDR 2.496,44	IDR 911.201,18
	c. 1 CCTV (24 hour per day @12 watt) Warehouse maintenance	0,288	kWh	IDR 1.444,70	IDR 416,07	IDR 151,866,86
2	cost a. Pest control	1	/month	IDR 50.000	IDR 1.643,84	IDR 600.000
3	Labor cost a. warehouse manager employee salary	1	/month	IDR 3.200.000	IDR 105.205,48	IDR 38.400.000
4	Depreciation cost a. Warehouse depreciation cost	1	/year	IDR 68.000.000	IDR 186.301,37	IDR 68.000.000
			Total			IDR 110.492.938

After obtaining the holding cost per year, holding cost each raw material for 220 ml bottled water is calculated.

Table 10. He	olding cost of packag	ing material
Description	Volume (m ³)/unit	Holding cost/ year
Cardboard	0,001683	IDR 607,62
Cardboard divider	0,00022	IDR 80,19
Cup	0,000006875	IDR 2,89
Lid cup	0,02116	IDR 7.640,62
Straw	0,0000026042	IDR 0,94

Forecasting

Before doing forecasting. Determination of demand data patterns is carried out which is useful for knowing the forecasting method to be used. The following is a plot of 220 ml bottled water product demand data.



Figure 2. Data plot of demand product

Figure 2. Above is a plot of 220 ml bottled water demand data, it can be seen that the data moves up and down around the average value. According to Joven et al. (2022), data patterns that experience an increase or decrease but are around the average value are horizontal or stationary patterns. Therefore, it can be concluded that the data pattern of 220 ml bottled water demand is a horizontal or stationary pattern. Furthermore, the autocorrelation test is carried out with MiniTab software to see if there is an element of trend in the data pattern.

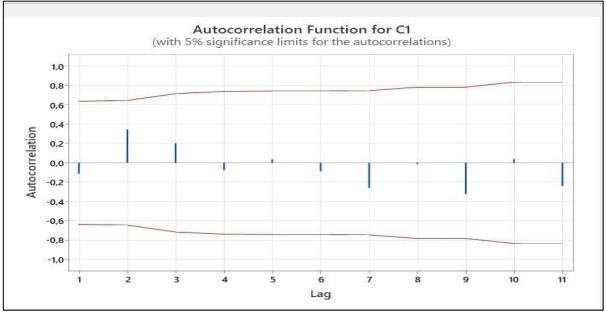


Figure 3. Autocorrelation graph

Based on Figure 3, it can be seen that the lag value does not cross the significance limit which indicates the absence of correlation between lags. The graph also shows that the lag value moves quickly to a value of 0, so it is concluded that there is no trend element in the data pattern and it is confirmed that the data pattern is stationary.

According to Lusiana and Yuniarty (2020), several forecasting methods that can be used for stationary data patterns are moving average, single exponential smoothing and weight moving average. The following are the results of forecasting with these three methods.

	Table	e 11. Forecastin	g data		
No.	Method		MAD	MSE	MAPE
1	Single Exponential Smoothing	$\alpha = 0,6$	1510,023	3637163,0	29,73%
2	Moving Average	10 month	898,45	1594602,43	22,04%
3	Weight Moving Average	10 month	1080,99	1374121,15	23,91%

Based on Table 11. above, it is observed that in the single exponential smoothing method, the smallest error is obtained with a value of α equal to 0.6. Furthermore, in the moving average method, the smallest error is obtained with a 10month moving average. Similarly, in the weight moving average method, the smallest error is obtained with a 10-month moving average. Subsequently, the errors of the three methods are compared, and it is found that the moving

average method with a 10-month moving average produces smaller errors in two indicators, namely MAD at 898.45 and MSE at 22.05%. Therefore, the moving average method with a 10-month moving average is selected to forecast the demand for 220 ml AMDK products for the next year. Before conducting the forecast, a verification tracking signal is performed to assess the accuracy of the forecast.

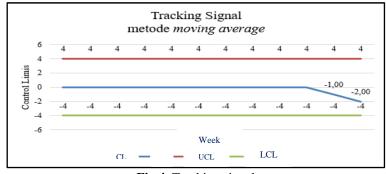


Fig 4. Tracking signal

Based on Figure 4. Above, it can be seen that there is no data that is outside the control limits so that the use of the moving average method in

March 2024

April 2024

May 2024

June 2024

Total

Average

9

10

11

12

forecasting 220 ml bottled water products is appropriate.

5.314

5.223

5.338

5 304

64.026

5.335

	Table	12. Forecasting results	
No	Month	Demand	~
1	July 2023	5.678,6	5.679
2	August 2023	5.555,1	5.555
3	September 2023	5.350,2	5.350
4	October 2023	5.348,1	5.348
5	November 2023	5.260,2	5.260
6	December 2023	5.179,3	5.179
7	January 2024	5.298,4	5.298
8	February 2024	5.176,5	5.176

5.314,2

5.222,7

5.338.3

5.304,3

Variability Test

Determining the type of demand is done so that the inventory method chosen is in accordance with the type of demand.

V
$$= \frac{n \sum_{t=1}^{n} D_{t}^{2}}{(\sum_{t=1}^{n} D_{t})^{2}} - 1$$

V
$$= \frac{12 (39.528.183)}{5.286.307.849} - 1$$
$$= 0.076755001$$

Based on the results of the calculation of demand variance, it is found that the variance value of 220 ml bottled water product demand is 0.076755001. The Peterson Silver rule explains that if the value of V < 0.25 then the demand is static, while if the value of $V \ge 0.25$

then the demand is dynamic. Based on the results of the variance measurement, the variance value V < 0.25 so that the type of demand for 220 ml bottled water products is static. This determination can facilitate the selection of inventory methods later in order to plan the right inventory. One of the inventory methods that can be used for static demand is the Economic Order Quantity (EOQ) method.

Master Production Schedule (MPS)

After obtaining the 220 ml AMDK product forecasting results for the next 12 months, an MPS is then made by converting the forecasting results into units of weeks. The following is the MPS for AMDK 220 products.

No	Month	Demand /month	Week	Demand /week	No	Month	Demand /month	Week	Demand /week
			1	1420				25	1325
1	July	5 670	2	1420	7	January	5.298	26	1325
1	2023	5.679	3	1420	1	2024	5.298	27	1324
			4	1419				28	1324
			5	1389				29	1294
2	August	5.555	6	1389	8	February	5.176	30	1294
2	2023	5.555	7	1389	0	2024	5.170	31	1294
			8	1388				32	1294
			9	1338				33	1329
3	September	5.350	10	1338	9	March	5.314	34	1329
3	2023	5.550	11	1337	9	2024	5.514	35	1328
			12	1337				36	1328
			13	1337				37	1306
4	October	5.348	14	1337	10	April	5.223	38	1306
4	2023	5.540	15	1337	10	2024	5.225	39	1306
			16	1337				40	1305
			17	1315				41	1335
5	November	5 260	18	1315	11	May	5 220	42	1335
5	2023	5.260	19	1315	11	2024	5.338	43	1334
			20	1315				44	1334
			21	1295				45	1326
6	December	5 170	22	1295	12	June	5 204	46	1326
0	2023	5.179	23	1295	12	2024	5.304	47	1326
			24	1294				48	1326

Material Requirement Planning (MRP) Netting

Netting is the process of calculating net requirements which are calculated from gross requirements (GR) minus scheduled receipts (SR) and inventory (OHI). The following is the calculation of net requirements for each item.

1. 220 ml AMDK product

The following is the net demand for 220 ml AMDK product.

Table 14. Netting of 220 ml AMDK product

-										•		
Compon		ıber	: WTR									
Part Nan	1e		: 220 r	n1 AME	OK prod	uct						
Level			: 0									
Qty			: 1									
Lead Tin	ne		1.4									
Week		July	2023		August 2023					Septemb	per 2023	
week	1	2	3	4	5	6	7	8	9	10	11	12
GR	1420	1420	1420	1419	1389	1389	1389	1388	1338	1338	1337	1337
SR												
OHI	118											
NR	1302	1420	1420	1419	1389	1389	1389	1388	1338	1338	1337	1337
Compon	ant Nur	ther	: WTF	2 001		· ·						
Part Nan		1001			DK proc	luct						
Level			: 0		bit pice	Juci						
			: 1									
Qty												
Lead Tin	ne		1 -									
Week		Octob	er 2023			Novem	ber 2023	3		Decemt	per 2023	
week	13	14	15	16	17	18	19	20	21	22	23	24
GR	1337	1337	1337	1337	1315	1315	1315	1315	1295	1295	1295	1294
SR												
OHI												
NR	1337	1337	1337	1337	1315	1315	1315	1315	1295	1295	1295	1294

Compon	and Mar		. 117	TR-00	1								
Part Nan		moer											
	ae			0 ml A	MDK	produ	lct						
Level			: 0										
Qty			: 1										
Lead Tir	ne		1 - C										
Week		Janu	ary 202	24		February 2024					Marci	h 2024	
week	25	26	33	3	3 1	33	33	31	32	33	34	35	36
GR	1325	132:	5 132	9 13	29 1	329	1329	1294	1294	1329	1329	1328	1328
SR													
OHI													
NR	1325	1325	5 132	9 13	29 1	329	1329	1294	1294	1329	1329	1328	1328
Compone	ent Num	iber	: WTF	2-001									
Part Nam	e		: 220 :	nl AMI	OK pro	fuct							
Level			: 0		•								
Qty			: 1										
Lead Tim	ıe		: -										
Week		April	2024			Ma	ay 2024			June	2024		Total
week	37	38	39	40	41	42	43	44	45	46	47	48	Total
GR	1306	1306	1306	1305	1335	133	5 133	4 1334	1326	1326	1326	1326	64.024
SR													
OHI													118
NR	1306	1306	1306	1305	1335	133	5 133	4 1334	1326	1326	1326	1326	63.906

2. Cardboard

The following is the net demand for cardboard.

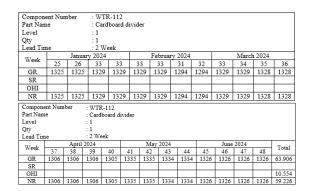
		Т	abl	e 15	5. N	let	ting	of c	card	boar	ď		
Compon Part Nan		nber		TR-11 rdboar									
Level			:1										
Qty			:1										
				Veek									
Lead Tin	ne					August 2023							
Week			2023	_		_					Septem		
	1	2	3	4		5	6	7	8	9	10	11	12
GR	1302	1420	142	0 14	19 1	389	1389	1389	1388	1338	1338	1337	1337
SR													
OHI	4680	3378	195	8 53	8								
NR				88	31 1	389	1389	1389	1388	1338	1338	1337	1337
Compon	ent Nu	nher	• W	TR-11	1								
Part Nan				rdboa									
Level	uc		: 1	nuova	iu -								
Otv			:1										
Lead Tir				Week									
Leas III	ne l	Oata	. 2 ber 20:		1	-	Nour	ber 2023	2		Decemt	or 2023	
Week	13	14	15			13	14	15	,	13	14	15	
CD.									1016				1004
GR	1337	1337	133	7 13	37 1	315	1315	1315	1315	1295	1295	1295	1294
SR													
OHI													
NR	1337	1337	133	7 13	37 1	315	1315	1315	1315	1295	1295	1295	1294
Compon Part Nan		nber		TR-11 irdboa									
Level	ie		- 1	idooa	ra								
Qty			:1	Week									
Lead Tin	ne												
Week			ary 202		-			ry 2024			March		
	25	26	33			33	33	31	32	33	34	35	36
GR	1325	1325	132	9 13	29 1	329	1329	1294	1294	1329	1329	1328	1328
SR													
OHI													
NR	1325	1325	132	9 13	29 1	329	1329	1294	1294	1329	1329	1328	1328
NR Compone			132		29 1	329	1329	1294	1294	1329	1329	1328	1328
	nt Num		_	-111	29 1	329	1329	1294	1294	1329	1329	1328	1328
Compone	nt Num		: WTF	-111	29 1	329	1329	1294	1294	1329	1329	1328	1328
Compone Part Nam	nt Num		: WTF : Card	-111	29 1	329	1329	1294	1294	1329	1329	1328	1328
Compone Part Nam Level	nt Num e	ber	: WTF : Card : 1 : 1 : 2 We	-111 board	29 1	329	1329	1294	1294	1329	1329	1328	1328
Compone Part Nam Level Qty Lead Tim	nt Num e		: WTF : Card : 1 : 1 : 2 We	-111 board	29 1		1329 [ay 2024		1294		1329	1328	
Compone Part Nam Level Qty	nt Num e	ber	: WTF : Card : 1 : 1 : 2 We	-111 board	29 1	M 42	(ay 2024 2 43		45			48	1328 Total
Compone Part Nam Level Qty Lead Tim Week GR	nt Num e ie	April	: WTF : Card : 1 : 2 We 2024	ek		M	(ay 2024 2 43	44	45	June 46	2024		
Compone Part Nam Level Qty Lead Tim Week	ent Num e ie 37	April 38	: WTF : Card : 1 : 2 We 2024 39	ek 40	41	M 42	(ay 2024 2 43	44	45	June 46	2024	48	Total
Compone Part Nam Level Qty Lead Tim Week GR	ent Num e ie 37	April 38	: WTF : Card : 1 : 2 We 2024 39	ek 40	41	M 42	lay 2024 2 43 35 133	44 133-	45 4 1326	June 46 1326	2024	48	Total

3. Cardboard divider

The following is the net demand for cardboard divider.

Table 16	Netting	of	Cardboard divider
1 and 10.	roung	01	

		010			. 0						-	
Compon	ent Nun	ıber	: WTR	2-112								
Part Nan	ne		: Card	board d	ivider							
Level			: 1									
Qty			: 1									
Lead Tin	ne		: 2 We	ek								
Week		July	2023			Augus	t 2023		:	Septem	per 2023	;
week	1	2	3	4	5	6	7	8	9	10	11	12
GR	1302	1420	1420	1419	1389	1389	1389	1388	1338	1338	1337	1337
SR.												
OHI	4680	3378	1958	538								
NR				881	1389	1389	1389	1388	1338	1338	1337	1337
Compon	ent Nun	ıber	: WTF	R-112								
Part Nan	ne		: Card	board d	ivider							
Level			: 1									
Qty			: 1									
Lead Tin	ne		: 2 We	eek								
Week		Octob	er 2023			Novemi	ber 2023	3		Decemb	er 2023	
week	13	14	15		13	14	15		13	14	15	
GR	1337	1337	1337	1337	1315	1315	1315	1315	1295	1295	1295	1294
SR												
OHI												
OHI NR	1337	1337	1337	1337	1315	1315	1315	1315	1295	1295	1295	1294



4. 220 ml bottled water

The following is the net demand for 220 ml bottled water.

	ient Num	ber	: WTR									
Part Nat	ne		: 220 n	1 bottled	water							
Level			: 1									
Qty			: 48									
Lead Ti	me		1 -									
Week	1	July	2023			Augus	t 2023			Septem	ber 2023	
week	1	2	3	4	5	6	7	8	9	10	11	12
GR	63681	69452	69452	69403	67936	67936	67936	67887	65442	65442	65393	65393
SR												
OHI	25											
NR	63656	69452	69452	69403	67936	67936	67936	67887	65442	65442	65393	65393
				1	10/220	01750	01950	07007	05112	05112	05575	05555
	ient Num	ber	: WTR									
Part Nar	ne			al bottled	water							
Level			: 1									
Qty			: 48									
Lead Tit	me		1.4									
Week		Octob	er 2023			Novem	ber 2023			Decemi	ber 2023	
week	13	14	15	16	17	18	19	20	21	22	23	24
GR	65393	65393	65393	65393	64317	64317	64317	64317	63339	63339	63339	63290
SR												
OHI	-											
NR	65393	65393	65393	65393	64317	64317	64317	64317	63339	63339	63339	63290
Compor Part Nar Level Qty Lead Ti		ber	: WTF : 220 r : 1 : 48	-113 nl bottled	l water							
Leas II	T	Tanua	rv 2024		1	Fabrua	ry 2024			Marci	h 2024	
Week	25	26	27	28	29	30	31	32	33	34	35	36
CD	64806	64806	64757	64757	63290	63290	63290	63290	65002	65002	64953	64953
	04800	04800	04/3/	04/3/	05290	03290	03290	03290	03002	03002	04955	04955
GR			-		-							
SR												
SR OHI		61006	64767	61767	62200	62200	62200					
SR	64806	64806	64757	64757	63290	63290	63290	63290	65002	65002	64953	64953
SR OHI NR Compon Part Nan Level Qty	ent Numb 1e	er	WTR-11 220 ml b 1 48			63290	63290	63290	65002	65002	64953	04933
SR OHI NR Compon Part Nan Level Qty Lead Tin	ent Numb 1e	er	WTR-11 220 ml b 1 48	3	ter		63290	63290			64953	
SR OHI NR Compon Part Nan Level Qty	ent Numb 1e	er	WTR-11 220 ml b 1 48	3 ottled wa	ter	May 2024	63290	63290			48	Total
SR OHI NR Compon Part Nan Level Qty Lead Tin	ent Numb ne 37	er April 21 38	WTR-11 220 ml b 1 48 - - - - - - - - - - - - - - - - - -	3 ottled war	ter	May 2024 2 43	44	45	June	2024	48	
SR OHI NR Compon Part Nan Level Qty Lead Tin Week GR SR	ent Numb ne 37	er April 21 38	WTR-11 220 ml b 1 48 - - - - - - - - - - - - - - - - - -	3 ottled war	ter 141 42	May 2024 2 43	44	45	June 46	2024	48	Total
SR OHI NR Compon Part Nan Level Qty Lead Tin Week GR	ent Numb ne 37 63877	April 20 38 63877 (WTR-11 220 ml b 1 48 - 024 39 3877 6	3 ottled war 40 4 3828 65	ter 141 42	May 2024 2 43 95 6524	6 65246	45 64855	June 46	2024	48 64855	Total

5. Straw

The following is the net demand for straw.

 Table 18. Netting of straw

							0					
	ent Numb	er	: WTR-	114								
Part Nan	ne		: Straw									
Level			:1									
Qty			: 48									
Lead Tir	ne		: 2 Wee	k								
Week		July	2023			Augu	ıst 2023			Septem	ber 2023	
week	1	2	3	4	5	6	7	8	9	10	11	12
GR	62496	68160	68160	68112	66672	2 66672	66672	66624	64224	64224	64176	64176
SR												
OHI	366000	303504	235344	167184	99072	2 32400						
NR						34272	66672	66624	64224	64224	64176	64176
Compor	ient Numi	her	: WTR-	114							-	
Part Nat			: Straw									
Level			: 1									
Qty			- 48									
Lead Ti	me		: 2 Weel	k								
		Octobe				Novemb	per 2023			Decemi	per 2023	
Week	13	14	15	16	17	18	19	20	21	22	23	24
GR	64176	64176	64176	64176	63120	63120	63120	63120	62160	62160	62160	62112
SR												
OHI												
NR	64176	64176	64176	64176	63120	63120	63120	63120	62160	62160	62160	62112
Compor	ient Numb	ar	: WTR-:	114								
Part Nat		JC1	: Straw	.14								
Level			: 1									
Otv			: 48									
Lead Ti	me		: 2 Weel	2								
		Januar				Februar	v 2024	1		March	1 2024	
Week	25	26	27	28	29	30	31	32	33	34	35	36
GR	63600	63600	63552	63552	62112	62112	62112	62112	63792	63792	63744	63744
SR												
OHI	-											
NR	63600	63600	63552	63552	62112	62112	62112	62112	63792	63792	63744	63744
141	1 02000	1 02000	25722	00002	V2112	V2112	V2112	V2112	05/92	05/92	05/44	05/44

Comp	onent Nu	mber	: WTR	-114									
Part N	ame		: Straw										
Level			:1										
Qty			: 48										
Lead 1	Time		: 2 We	ek									
Week		April	2024			May	2024			June	2024		Total
week	37	38	39	40	41	42	43	44	45	46	47	48	
GR	62688	62688	62688	62640	64080	64080	64032	64032	63648	63648	63648	63648	3.067.488
SR.													
OHI													1.203.504
NR	62688	62688	62688	62640	64080	64080	64032	64032	63648	63648	63648	63648	2.701.488

6. Cup

The following is the net demand for cup.

								0					
Compone	nt Numbe	ar 🛛	: WTF	2-211									
Part Nam	e		: Cup										
Level			: 2										
Qty			: 1										
Lead Tim	ie		: 2 We	ek									
Week			2023					st 2023				mber 202	
	1	2	3	4		5	6	7	8	9	10		12
GR	63656	69452	69453	2 694	103	67936	67936	67936	67887	6544	2 6544	12 6539	3 65393
SR		540000											
OHI	126000	62344	53289	2 463	440 3	94037	326101	258165	190229	12234			
NR											854	2 6539	3 65393
Compone		er 🛛	: WT										
Part Nam	e		: Cup										
Level			: 2										
Qty			: 1										
Lead Tim	ie		: 2 W	eek									
Week		Octol	per 2023				Novemb	er 2023			Decen	iber 202	3
week	13	14	15	1	6	17	18	19	20	21	22	23	24
GR	65393	65393	6539	3 653	93 6	4317	64317	64317	64317	63339	63339	63339	63290
SR													
OHI			+	-	_							-	-
NR	65393	65393	6539	3 653	103 6	4317	64317	64317	64317	63339	63339	63339	63290
					0010	4517	04517	04517	04517	05557	1 05555	10555	105250
	ent Numb	er		R-211									
Part Nam	ie		: Cup										
Level			: 2										
Qty			:1										
Lead Tin	ae		: 2 W		_								
Week			ary 2024		_		Februar					ch 2024	
	25	26	27		8	29	30	31	32	33	34	35	36
GR	64806	64806	6475	7 64	757 6	3290	63290	63290	63290	65002	65002	64953	64953
SR													
OHI													
NR	64806	64806	6475	7 64	757 6	3290	63290	63290	63290	65002	65002	6495	64953
C	ent Numbe												
Part Nam			: WTR-2	11									
Level	e		: Cup : 2										
Otv			: 1										
Lead Tim			. 1 : 2 Week										
Lead 1 m	le	April 2					lav 2024			June	2024		Total
Week	37	38	39	40	41	42	43	44	45	46	2024 47	48	Total
GR	63877		63877	63828	65295	6529			64855	64855	64855	64855	3.125.632
SR	038//	038//	030//	03028	05295	0525	03240	03240	04833	04033	04833	04033	540.000
OHI						+		+	-				2.532.450
NR	63877	63877	63877	63828	65295	6529	65246	5 65246	64855	64855	64855	64855	2.459.632
INK	030//	030//	030//	02028	05293	1 0025	03240	1 03240	104833	0+633	0+600	04033	2.437.032

Table 19. Netting of cup

7. Lid cup The following is the net demand for lid cup.



Table 20. Netting of Lid cup

Compon	ent Num	ber	: 17	TR-213											
Part Nan	ne	: Lid Cup													
Level			: 2												
Qty			: 1												
Lead Tir	ne		: 2	Week											
		January 2024 February 2024 March 2024													
Week	25														
GR	6480	6 64806 64757 64757 63290 63290 63290 63290 65002 65002 64953 64									53 64953				
SR															
OHI															
NR	6480	6 6480	06 64	757 6	4757	63290	63290	63290	63290	65002	6500	2 649	53 64953		
~															
Part Nam		t Number : WTR-213													
	e		: Lid C : 2	up											
Level			:1												
Qty Lead Tin															
Lead Im	le														
Week	37	April 2024 May 2024 June 2024 Total 37 38 39 40 41 42 43 44 45 46 47 48													
GR	63877	63877	63877	63828	6529				64855	64855	64855	48	3.125.632		
SR	038//	036//	058//	03828	0325	0029	5 03240	03240	04833	04633	04633	04633	3.143.032		
OHI				<u> </u>			-	-					3.881.108		
NR	63877	63877	63877	63828	6529	5 6529	5 65246	65246	64855	64855	64855	64855	2.434.432		
144	05877	05877	038//	05020	1 0525	0 1 0029	5 1 00240	1 03240	1 04833	04000	04833	04000	2.434.432		

Lotting

There is a difference in the lotting calculation in the MRP process, where there is a constraint in the shipping capacity of packaging raw materials at PT XYZ. The lotting stage aims to determine the optimal order size based on net requirements, ordering costs, and storage costs.

However, due to restrictions in shipping capacity, the determination of the optimal quantity is carried out using the EOQ developed by Zhao et al. (2004) as described in Mubin et al. (2021). This involves the following steps: Optimal Q = EOQ if $Q_{min} < EOQ \le Q_{max}$ or Optimal $Q = Q_{min}$ if $TIC(Q_{min}) \le TIC(Q_{max})$ or Optimal $Q = Q_{max}$ if $TIC(Q_{min}) > TIC(Q_{max})$

Furthermore, lot sizing calculations for each packaging raw material are carried out as follows:

1. Cardboard and Cardboard Dividers Cardboard and cardboard dividers are ordered from the same supplier and considered as one unit. Therefore, the lot sizing calculation for cardboard and cardboard dividers shares the same value. The following are the lot sizing calculations using EOQ with delivery capacity constraints for these items.

Range	Min	Max	EOQ	$\begin{array}{l} \operatorname{Min} < \operatorname{EOQ} \leq \\ \operatorname{Max} \end{array}$	TIC EOQ	TIC Min	TIC Max
1	10.000	12.000	40.892	False	-	IDR276.493.303	IDR 277.066.471
2	12.001	15.000	44.348	False	-	IDR 276.053.702	IDR 267.112.890
3	15.001	18.000	47.552	False	-	IDR 273.113.602	IDR 274.187.590

2. Straw

The following is a lot sizing calculation using EOQ delivery capacity constraints for straw items.

2 1.000.001 1.000.000 4.798.503 False - IDR 55.474.383 IDR 47.630.268				1	1 5			
2 1.000.001 1.000.000 4.798.503 False - IDR 55.474.383 IDR 47.630.268	Range	Min	Max	EOQ	$Min < EOQ \le Max$	TIC EOQ	TIC Min	TIC Max
	1	550.000	600.000	3.632.793	False	-	IDR47.946.954	IDR 47.974.380
3 1 500 001 1 500 000 5 731 848 False - IDR 52 130 269 IDR 46 831 63 0	2	1.000.001	1.000.000	4.798.503	False	-	IDR 55.474.383	IDR 47.630.268
	3	1.500.001	1.500.000	5.731.848	False	-	IDR 52.130.269	IDR 46.831.630

Table 22. Optimal order quantity calculation result for staw

3. Cup

The following is the EOQ calculation for cup item.

EOQ	$=\sqrt{\frac{2\mathrm{DS}}{\mathrm{h}}}$
	$=\sqrt{\frac{2(2.459.632)(7.140,61)}{(2,89)}}$
	= 110.128,93
	≈ 110.129 pcs

It was found that the EOQ value for cup items did not meet the minimum purchase requirement set by the supplier, which is 540,000 pcs. Therefore, the optimal order quantity for cup items follows the supplier's minimum order of 540,000 pcs.

 Lid cup The following is a lot sizing calculation using EOQ delivery capacity constraints for lid cup items.

Table 23. C	Optimal order	quantity cal	lculation re	sult for li	d cup
-------------	---------------	--------------	--------------	-------------	-------

Range	Min	Max	EOQ	$Min < EOQ \le Max$	TIC EOQ	TIC Min	TIC Max
1	44	50	261	False	-	IDR87.747.149	IDR 87.764.340
2	51	100	345	False	-	IDR92.257.973	IDR 88.909.389
3	101	150	412	False	-	IDR 91.889.838	IDR 87.125.910

Offsetting

Offsetting is one of the stages in the MRP (Material Requirements Planning) process used to determine the optimal time for placing orders, ensuring that the net requirements are met according to a predetermined schedule. The ordering time is adjusted by considering the waiting time or lead time of the raw materials being ordered. The following details the offsetting for each packaging raw material.

1. Cardboard and cardboard divider The following are the offsetting results for cardboard items and cardboard dividers.

Compor	ont Nu	nher	·WTE	2-111 &	WTR-11	,						
Part Nar						ard divid	ler					
Level			: 1									
Qty			:1									
Lead Ti	me		: 2 We	eek								
Lot Sizi	ng		: EOQ	2								
Week		July	2023			Augus	t 2023		;	Septeml	ber 2023	3
WCCK	1	2	3	4	5	6	7	8	9	10	11	12
GR.	1302	1420	1420	1419	1389	1389	1389	1388	1338	1338	1337	1337
SR.												
OHI	4680	3378	1958	538	14119	12730	11341	9952	8564	7226	5888	4551
NR				881								
PORec				15000								
PORel		15000										

Compon		mber			WTR-1								
Part Nar	ne			lboard a	ınd Card	board di	vider						
Level			: 1										
Qty			: 1										
Lead Tin			: 2 W	eek									
Lot Sizi	ng		: EOQ	2									
Week		Octo	ber 2023			Nov	ember	2023			Decem	ber 202	3
week	13	14	15	16	11	/ 1	8	19	20	21	22	23	24
GR	1331	1337	1337	133	7 131	5 13	15	1315	1315	1295	1295	1295	1294
SR													
OHI	3214	1877	540	1420	03 128	66 11	551 1	10236	8921	7606	6311	5016	3721
NR			797										
PORec		-	15000				_						
PORel	1500	0	10000	-									1500
Compor	ent Nu	mber	: WT	R-111 /	& WTR-	112							
Part Nar		moon			and Card		ivider						
Level			:1		ano cure	000000							
Otv			:1										
Lead Ti	ma		: 2 W	aak									
Lot Sizi			: EO0										
LOUSIZE	T	Tom	arv 2024			Fal	oruary	2024			Mara	h 2024	
Week	25	26	33	33	3		33	31	32	33	34	35	36
GR	1325							1294	1294	1329	1329	1328	1328
SR	1325	1525	1329	152	.9 15	29 1.	529	1294	1294	1329	1329	1328	1320
OHI	2427	1102	1477	7 134	53 121	20 10	835	9541	8247	6953	5624	4295	2967
NR	2427	223	14//	/ 154	55 121	29 10	222	9541	8247	6933	3624	4295	2967
						_							
PORec	-	15000)			_							
PORel													1500
Compone		ıber	: WTR-	111 & V	/TR-112								
Part Nam	le			ard and	Cardboa	rd divide	91						
Level			:1										
Qty			:1										
Lead Tin			: 2 Weel	ĸ									
Lot Sizin	g		: EOQ						-		2024		
Week	37	Apri. 38	39	40	41	May 2	43	44	45	June 46	47	48	Total
GR	1306	1306	1306	1305	1335	42	1334			1326	1326	48	63.906
	1300	1300	1300	1303	1333	1335	1334	1334	1320	1320	1320	1320	03.900
SP		333	14027	12721	11416	10081	8746	7412	6078	4752	3426	2100	34606
SR			14027	12121	11410	10001	0740	/412	0078	4752	3420	2100	34000
OHI	1639	973											
OHI NR	1639	973 15000						-			-		60000
OHI	1639	973 15000						-					60000

2. Straw The following are the offsetting results for Straw.

		1	able	43.	Louin	ig o	i su	aw		
	ent Number	r		R-114		-				
Part Nam	ie		: Stra	W						
Level Otv			: 1 : 48							
Lead Tin	ne		: 2 W	'eek						
Lot Sizin			: EO(
Week	-	Ju	ly 2023					Augus	t 2023	
	1	2	3		4	5		6	7	8
GR SR	62496	68160	681	60	68112	666	12	66672	66672	66624
OHI	366000	303504	1 2353	14	167184	990	72	32400	1465728	1399056
NR	500000	50550	1 2555		10/104	,,,,	12	34272	1405720	1577050
PORec			-					1500000		
PORel					1500000					
Compone	ent Numbe	r	: W1	R-114	1					
Part Nam	ne		: Str	aw						
Level			: 1 : 48							
Qty Lead Tin	ne		: 48 : 2 V	Jeek						
Lot Sizin			: EO							
	<u> </u>	Septe	ember 20					Octobe	er 2023	
Week	9	10	1		12	1		14	15	16
GR	64224	64224	4 641	76	64176	641	176	64176	64176	64176
SR	1000400	12(02)	100	004	1120000	107/	- 622	1011455	0.47200	002104
OHI NR	1332432	126820	08 1203	984	1139808	1075	0052	1011456	947280	883104
PORec			+							
PORel										
	ent Numbe		11/1	R-114	1					
Part Nam			: Stra							
Level			: 1							
Qty			: 48							
Lead Tin			: 2 W							
Lot Sizin	g	Norm	: EO					Decemb	2022	
Week	17	18	mber 202		20	2	1	Decemb 22	23	24
GR	63120	63120	6312		63120	6216		62160	62160	62112
SR				-						
			6026		629568	5664	148	504288	442128	379968
OHI	818928	755808	6926	88	029308	0004				
NR	818928	755808	6926	88	029308	0004		501200	112120	
NR PORec	818928	755808	6926	88	029308	2004		501200	112120	
NR <u>PORec</u> PORel Compone	ent Numbe		: W1	R-114		3004				
NR PORec PORel Compone Part Nam Level Qty Lead Tin	ent Numbe ne		: WT : Stra : 1 : 48 : 2 W	R-114 aw		3004				
NR PORec PORel Compone Part Nam Level Qty Lead Tin Lot Sizin	ent Numbe ne	r	: WT : Stra : 1 : 48	TR-114 aw Jeek Q		3004		Februar		
NR PORec PORel Compone Part Nam Level Qty Lead Tin	ent Numbe ne	r	: WT : Stra : 1 : 48 : 2 W : EO	TR-114 aw Veek Q		2				32
NR PORec PORel Compone Part Nam Level Qty Lead Tin Lot Sizim Week GR	ent Numbe ie ne g	r	: WI : Stra : 1 : 48 : 2 W : EO uary 2024 2'	TR-114 aw Jeek Q I			9	Februar	ry 2024	
NR PORec PORel Compone Part Nam Level Qty Lead Tin Lot Sizin Week GR SR	ne lg 25 63600	Jani 26 63600	: WTI : Stra : 1 : 48 : 2 W : EO uary 2024 2' 0 635	7 7 7 7 52	28 63552	29 621	9	Februar 30 62112	ry 2024 31 62112	32 62112
NR PORec PORel Compone Part Nam Level Qty Lead Tin Lot Sizin Week GR SR OHI	ent Numbe ne ng 25	Jan 26	: WTI : Stra : 1 : 48 : 2 W : EO uary 2024 2' 0 635	7 7 7 7 52	28	2:	9	Februar 30 62112 1440	ry 2024 31	32
NR PORec PORel Compone Part Nam Level Qty Lead Tin Lot Sizin Week GR SR OHI NR	ne lg 25 63600	Jani 26 63600	: WTI : Stra : 1 : 48 : 2 W : EO uary 2024 2' 0 635	7 7 7 7 52	28 63552	29 621	9	Februar 30 62112 1440 60672	ry 2024 31 62112	32 62112
NR PORec PORel Compone Part Nam Level Qty Lead Tin Lot Sizin Week GR GR GR OHI NR PORec	ne lg 25 63600	Jani 26 63600	: WTI : Stra : 1 : 48 : 2 W : EO uary 2024 2' 0 635	7 7 7 7 52	28 63552 127104	29 621	9	Februar 30 62112 1440	ry 2024 31 62112	32 62112
NR <u>PORec</u> PORel Compone Part Nam Level Qty Lead Tin Lot Sizim Week GR SR OHI NR <u>PORec</u> PORel	ent Number ae 25 63600 317856	Jani 26 63600 25425	: WT : Stra : 1 : 48 : 2 W : EO uary 2024 2' 0 635 6 1906	R-114 ww /eek Q F 52 556	28 63552 127104 150000	29 621	9	Februar 30 62112 1440 60672	ry 2024 31 62112	32 62112
NR PORec PORel Compone Part Nam Level Qty Lead Tin Lot Sizin Week GR GR SR OHI NR PORec PORel Compone	ent Number re 25 63600 317856 ent Numbe	Jani 26 63600 25425	: WT : Str : 1 : 48 : 2 W : EO uary 2024 0 635 6 1900 : WT	TR-114 aw /eek Q 4 7 52 556 556 TR-114	28 63552 127104 150000	29 621	9	Februar 30 62112 1440 60672	ry 2024 31 62112	32 62112
NR <u>PORec</u> PORel Compone Part Nam Level Qty Lead Tin Lot Sizim Week GR SR OHI NR <u>PORec</u> PORel	ent Number re 25 63600 317856 ent Numbe	Jani 26 63600 25425	: WT : Stra : 1 : 48 : 2 W : EOO uary 2024 2' 0 635 6 1906 : WT : Stra : 1	TR-114 aw /eek Q 4 7 52 556 556 TR-114	28 63552 127104 150000	29 621	9	Februar 30 62112 1440 60672	ry 2024 31 62112	32 62112
NR PORel Compone Part Nam Level Qty Lead Tini Week GR GR SR OHI NR PORel Compone Part Nam Level Qty	ent Numbe ae 25 63600 317856 ent Numbe ae	Jani 26 63600 25425	: WTI : Stra: : 1 : 48 : 2 W : EO mary 2024 2' 0 635 6 1900 : WTI : Stra: : 1 : 48	R-114 aw /eek Q 4 7 52 5556 7 7 8556 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7	28 63552 127104 150000	29 621	9	Februar 30 62112 1440 60672	ry 2024 31 62112	32 62112
NR PORec PORel Compone Port Nam Level Qty Lead Tin Lot Sizin Week GR GR SR OHI NR PORec PORel Compone Port Nam Level Qty Lead Tin	ent Numbere re <u>g</u> 25 63600 317856 ent Numbere re	Jani 26 63600 25425	: WTI : Stra: : 1 : 48 : 2 W : EOO : 0 : 635 : 0 : 635 : 0 : 635 : 0 : 635 : 0 : 1 : 48 : 2 W : 2 : 2 W : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2	7 7 552 7 7 555 7 7 7 552 7 7 7 7 7 7 7	28 63552 127104 150000	29 621	9	Februar 30 62112 1440 60672	ry 2024 31 62112	32 62112
NR PORec PORel Compone Part Nam Level Qty Lead Tini Week GR GR SR OHI NR PORec PORel Compone Part Nam Level Qty	ent Numbere re <u>g</u> 25 63600 317856 ent Numbere re	Jam 26 63600 25425	: WT : Stra : 1 : 48 : 2 W : EO uary 2024 : 6 : 6 : 9 : 6 : 1 : 6 : 1 : 4 : 8 : 2 W : 2024 : 6 : 1 : 6 : 2 : 1 : 6 : 2 : 1 : 6 : 2 : 2 : 2 : 0 : 2 : 1 : 6 : 2 : 2 : 2 : 0 : 6 : 6 : 1 : 6 : 6 : 2 : 1 : 6 : 6 : 1 : 6 : 6 : 1 : 6 : 6 : 1 : 6 : 6 : 6 : 7 : 1 : 6 : 6 : 7 : 1 : 6 : 6 : 1 : 1 : 6 : 1 : 1 : 6 : 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1	R-114 aw /eek Q 7 552 5556 	28 63552 127104 150000	29 621	9	Februar 30 62112 1440 60672 1500000	ry 2024 31 62112 1439328	32 62112
NR PORec PORel Compone Port Nam Level Qty Lead Tin Lot Sizin Week GR GR SR OHI NR PORec PORel Compone Port Nam Level Qty Lead Tin	ent Numbere 10 12 13 17856 13 17856 13 17856 10 10 10 10 10 10 10 10 10 10	Jani 26 63600 25425	: WT : Stra : 1 : 48 : 2 W : EO uary 2022 2' 0 : 635 6 : WT : Stra : 48 : 2 W : Stra : 48 : 2 W : Stra : 1 : 48 : 2 W : 20 : 20 : 20 : 20 : 20 : 20 : 20 : 20	7eek Q 7552 5556 7R-114 aw Veek Q	28 63552 127104 150000 4	2: 621 635	9 12 552	Februa 30 62112 1440 60672 1500000 April	ry 2024 31 62112 1439328 2024	32 62112 1377216
NR PORel Porel Compone Part Nam Level Qty Lead Tin Lot Sizin Week GR GR SR OHI NR PORec PORel Compone Part Nam Level Qty Lead Tin Lot Sizin	ent Numbere e 25 63600 317856 ent Numbere e 33 33	Jam 26 63600 25425	: WT : Stra: : 1 : 448 : 2 W : EO uary 2024 2' 0 635 6 : 0 635 6 : 0 635 6 : 0 635 6 : 1 : 5tra: : 1 : 5tra: : 1 : 5tra: : 1 : 5tra: : 2 W : 2024 2' 0 635 6 : 1 : 1 : 5tra: : 2 W :	Veek Q 4 7 52 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	28 63552 127104 150000	29 621	9 12 552 7	Februar 30 62112 1440 60672 1500000 April 38	ry 2024 31 62112 1439328 2024 39	32 62112 1377216
NR PORel Compone Part Nam Level Qty Lead Tin Lot Sizin Week GR GR SR OHI NR <u>PORel</u> Compon Part Nam Level Qty Lead Tin Level Tin Level Tin Lot Sizin	ent Numbere 18 25 63600 317856 ent Numbere 18 33 63792	Jani 26 63600 25425 7	: WT : Str : 1 : 48 : 2 W : EO uary 202- 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 :	Veek Q 4 7 52 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	28 63552 127104 150000 4	2: 621 6355	9 12 552 7	Februa 30 62112 1440 60672 1500000 April	ry 2024 31 62112 1439328 2024	32 62112 1377210
NR PORel PorRel Compone Part Nam Level Oty Lead Tim Lot Sizim Week GR GR GR GR GR Compone PorRel PORel PORel Compone Port Nam Level Compone Port Nam Level Compone Port Nam Level GR GR GR GR GR GR GR SR OHI OHI	ent Numbere e 25 63600 317856 ent Numbere e 33 33	Jam 26 63600 25425	: WT : Str : 1 : 48 : 2 W : EO uary 202- 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 :	R-114 aw 7eek Q 7 552 5556 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	28 63552 127104 150000 4	2: 621 6355	9 12 552 7 588	Februar 30 62112 1440 60672 1500000 April 38	ry 2024 31 62112 1439328 2024 39	32 62112 1377210 40 62640
NR RORec PORel Component Part Nam Level Qty Lead Tim Lot Sizin Week GR SR OHI NR RORel Compone Part Nam Level Qty Lead Tim Lot Sizin Week GR GR SR NR NR NR NR NR NR NR NR NR NR NR NR NR	ent Numbere 18 25 63600 317856 ent Numbere 18 33 63792	Jani 26 63600 25425 7	: WT : Str : 1 : 48 : 2 W : EO uary 202- 2' 0 635 6 1900 : Str : 1 : 48 : 2 W : EO uary 202- 2' 0 635 6 1900 : Str : 1 : 4 : 2 W : EO control (1) : 5 Str : 1 : 1 : 48 : 2 W : EO control (1) : 5 Str : 20 : 20 : 5 Str : 20 : 20 : 5 Str : 20 : 20 : 5 Str : 1 : 1 : 48 : 2 W : EO control (1) : 5 Str : 20 : 20 : 5 Str : 20 : 20 : 5 Str : 20 : 20 : 20 : 5 Str : 20 : 20 : 20 : 5 Str : 20 : 20 : 20 : 5 Str : 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1	R-114 aw 7eek Q 7 552 5556 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	28 63552 127104 150000 4 36 63744	22 621 635 635	9 12 552 7 588	Februar 30 62112 1440 60672 1500000 April 38 62688	ry 2024 31 62112 1439328 2024 39 62688	32 62112 1377210 40 62640
NR PORel PORel Component Part Nam Level Qty Lead Tin Week GR GR GR GR OHI NR PORel Compon OHI Lot Sizin Level Qty Lead Tin Lot Sizin Compon Compon Sizin Compon C	ent Numbere 18 25 63600 317856 ent Numbere 18 33 63792	Jani 26 63600 25425 7	: WT : Str : 1 : 48 : 2 W : EO uary 202- 2' 0 635 6 1900 : Str : 1 : 48 : 2 W : EO uary 202- 2' 0 635 6 1900 : Str : 1 : 4 : 2 W : EO control (1) : 5 Str : 1 : 1 : 48 : 2 W : EO control (1) : 5 Str : 20 : 20 : 5 Str : 20 : 20 : 5 Str : 20 : 20 : 5 Str : 1 : 1 : 48 : 2 W : EO control (1) : 5 Str : 20 : 20 : 5 Str : 20 : 20 : 5 Str : 20 : 20 : 20 : 5 Str : 20 : 20 : 20 : 5 Str : 20 : 20 : 20 : 5 Str : 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1 : 1	R-114 aw 7eek Q 7 552 5556 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	28 63552 127104 150000 4 36 63744	22 621 635 635	9 12 552 7 588	Februar 30 62112 1440 60672 1500000 April 38 62688	ry 2024 31 62112 1439328 2024 39 62688	32 62112 1377210 40 62640
NR PORet PORel PORel Compone Part Nam Level Qty Lead Tin Lot Sizin NR PORet SR NR PORet Compone Part Nam Level Qty Lead Tin NR R Compone Part Nam Level Qty Lead Tin NR R PORet Compone Compone Part Nam Level Qty Lead Tin NR R Compone Part Nam Level Qty Lead Tin NR R Compone Part Nam Level Qty Lead Tin NR R Compone Part Nam Level Lead Tin Level Lead Tin Level Lead Tin Level Lead Tin Level Lead Tin Level Lead Tin Level Lead Tin Level R R R R R R R R R R R R R R R R R R R	ent Number 25 63600 317856 ent Number 1315104 1315104 ent Number e	Jani 26 63600 25425 7	: WTR-1 : WTR-1 : 48 2 W : 20 2 2 2 2 3 2 3 2 3 2 3 2 : 3 2 : WTR-1 : 48 : 48 : 2 W : 48 : 48 : 2 W : 48 : 3 2 : 3 2 : 48 : 58 : 48 : 48 : 48 : 58 : 58	R-114 R-114 R-114 R-114	28 63552 127104 150000 4 36 63744	22 621 635 635	9 12 552 7 588	Februar 30 62112 1440 60672 1500000 April 38 62688	ry 2024 31 62112 1439328 2024 39 62688	32 62112 1377210 40 62640
NR PORet PORel PORel Component Part Nam Level Qty Lead Tim NR PORec PORel Compone PORel Compone Part Nam Level Qty Lead Tim NR RORec Compone PORel Compone Porel Compone Porel Compone Porel Compone Porel Compone Porel Compone Porel Compone Porel Compone Porel Compone Com	ent Number 25 63600 317856 ent Number 1315104 1315104 ent Number e	Jam 26 63600 25425 7 r	: WTR : WTR-1 : Straw : WTR-1 : Straw : Straw : : Straw : : 2Wee : : 2Wee : : : 2Wee	R-114 R-114 R-114 R-114	28 63552 127104 150000 4 36 63744	22 621 635 635	9 12 352 7 588 0032	Februar 30 62112 1440 60672 1500000 April 38 62688 997344	ry 2024 31 62112 1439328 2024 39 62688	32 62112 1377216 871968
NR PORel PORel Compone Part Nam Level Qty Lead Tin Lot Sizin SR SR SR SR SR SR Compon Part Nam Level Qty Lead Tin Level Qty Lead Tin KR PORel GR SR Compone Part Nam R PORel SR Compone Part Nam SR Compone Part Nam SR Compone SR SR SR SR SR SR SR SR SR SR SR SR SR	ent Number 25 63600 317856 ent Number 1315104 1315104 ent Number e	Jam 26 63600 25425 25425 125131 125131 125131	WTR-1 WTR-1 2 WTR-1 48 2 W 2 0 3 0 2 0 48 2 0 0 2 0 3 0 2 0 3 2 6 1900 2 0 3 2 6 3 2 0 3 3 2 0 3 3 2 0 3 3 2 0 3 3 2 0 3 3 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	R-114 R-114 R-114 R-114	28 63552 127104 150000 4 36 63744 1123776	2: 621 635 635 622 1060	9 112 552 7 5888 0032 Jun	Februar 30 62112 1440 60672 1500000 April 38 62688 997344	y 2024 31 62112 1439328 2024 39 62688 934656	32 62112 1377216
NR PORel PORel PORel Component Revel Revel Revel Week GR GR SR SR SR SR Compone PORel Compone PORel Compone V Revel Compone Co	ent Number e 25 63600 317856 ent Number e 33 63792 1315104 1315104 e 8	Jam 26 63600 25425 7 r	: WTR : WTR-1 : Straw : WTR-1 : Straw : Straw : : Straw : : 2Wee : : 2Wee : : : 2Wee	R-114 aw 7 552 5556 5556 5556 5556 5556 5556 744 7 7 8 8 9 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9	28 63552 127104 150000 4 36 63744 1123776	2: 621 635 635 626 1060	9 12 352 7 588 0032	Februar 30 62112 1440 60672 1500000 April 38 62688 997344	ry 2024 31 62112 1439328 2024 39 62688	32 62112 1377216 871968 771968
NR PORet PORel PORel Component Part Nam Level Qty Lead Tim NR PORec PORel NR PORec Compone Part Nam Level Qty Lead Tim Level Compone Part Nam Level Compone Part Nam Level Compone Port NR R PORec Compone Part Nam Level Compone Part Nam Level Compone Part Nam Level Compone Part Nam Level SR SR SR SR SR SR SR SR SR SR SR SR SR	ent Number 125 63600 317856 317856 ent Number 1315104 1315104 1315104 ent Number e 131504 1315104	Jam 26 63600 25425 5 25425 5 125131 1 125131 1 42 64080	: WT : WT : 1 : 48 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 3 : 3 : 3 : 3 : 3 : 3 : 3 : 3 : 3 : 2 : 3 : 3 : 3 : 3 : 3 : 3 : 11 : 12 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 1 : 1 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 <td: 1<="" td=""> : 1</td:>	R-114 aw 75556 5556 7775557 7775557 7775557 777557 777557 777557 777557 777557 777557 777557 777557 777557 77757 777557 777577 777577 777577 777577 777577 777577 777577 777577 777577 777577 777577 777577 777577 7775777 7775777 7775777 77757777 7775777777	28 63552 127104 150000 4 1123776	2: 621 635 635 1060	9 12 552 7 588 0032 46 63648	Februar 30 62112 1440 60672 1500000 April 38 62688 997344 997344 997344	ry 2024 31 62112 1439328 2024 39 62688 934656 934656	32 62112 1377216 871968 871968 70540 871968 3067488
NR PORel Component Part Nam Level Qty Lead Tim Lot Sizin GR SR OHI NR PORel Compone Part Nam ROBSEC GR GR SR OHI NR PORel Component SR OHI NR ROBSEC Component SR OHI NR ROBSEC SR OHI Component SR OHI SR OHI OHI OHI OHI	ent Number 25 63600 317856 	Jam 26 63600 25425 25425 7 7 7 7 7 7 7 8 4 8 34 63792 9 9 125131 9 125131	: WT : WT : WT : 1 : 48 : 2 We : 2 : WT : 1 : 48 : 2 We : 2 : WT : 1 : 48 : 2 : WT : 1 : 48 : 2 : WT : 1 : 48 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2	R-114 aw 7 552 556 7 7 7 552 556 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	28 63552 127104 150000 4 1123776	2: 621 635 635 1060	9 12 552 7 588 0032 Jun 46	Februar 30 62112 1440 60672 1500000 April 38 62688 997344 997344 997344	ry 2024 31 62112 1439328 2024 39 62688 934656 934656	32 62112 1377216 871968
NR PORel PORel PORel PORel Component Revel Revel Week GR SR SR SR SR SR SR SR SR SR SR SR SR SR	ent Number 125 63600 317856 317856 ent Number 1315104 1315104 1315104 ent Number e 131504 1315104	Jam 26 63600 25425 5 25425 5 125131 1 125131 1 42 64080	: WT : WT : 1 : 48 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 3 : 3 : 3 : 3 : 3 : 3 : 3 : 3 : 3 : 2 : 3 : 3 : 3 : 3 : 3 : 3 : 11 : 12 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 1 : 1 : 2 : 2 : 2 : 2 : 2 : 2 : 2 : 2 <td: 1<="" td=""> : 1</td:>	R-114 aw 75556 5556 7775557 7775557 7775557 777557 777557 777557 777557 777557 777557 777557 777557 777557 77757 777557 777577 777577 777577 777577 777577 777577 777577 777577 777577 777577 777577 777577 777577 7775777 7775777 7775777 77757777 7775777777	28 63552 127104 150000 4 1123776	2: 621 635 635 1060	9 12 552 7 588 0032 46 63648	Februar 30 62112 1440 60672 1500000 April 38 62688 997344 997344 997344	ry 2024 31 62112 1439328 2024 39 62688 934656 934656	32 62112 1377216 871968 871968 70540 871968 3067488

 Table 25. Lotting of straw

3. Cup

The following are the offsetting results for Cup.

Compone	ent Number		: WTR-21	1				
Part Nan	ie		: Cup					
Level			:2					
Qty			: 1					
Lead Tin	ne		: 2 Week					
Lot Sizin	g		: EOQ					
Week		July	2023			Augu	st 2023	
week	1	2	3	4	5	6	7	8
GR	63656	69452	69452	69403	67936	67936	67936	67887
SR.		540000						
OHI	126000	62344	532892	463440	394037	326101	258165	190229
NR								
PORec								
PORel								540000

	nt Numbe	r	: W1	R-211					
Part Name			: Cu						
Level			: 2						
Qty			: 1						
Lead Time			: 2 V						
Lot Sizing			: EO						
Week			mber 20					er 2023	1
	9	10	1		12	13	14	15	16
GR	65442	65442	653	93	65393	65393	65393	65393	65393
SR	100010		524	150		100 670	005070	2 / 2 2 2 2	20110
OHI	122342	56900	531	458 4	66065	400672	335279	269886	20449
NR		8542 54000							
PORec		54000	5						
PORel									
Componen		£		ΓR-211					
Part Name			: Cu	р					
Level			: 2						
Qty Lead Time			: 1	Veek					
Lead Time Lot Sizing									
Lot Sizing		27	: EC mber 20				Deren	ber 2023	
Week	17				20	21			24
GR	64317	18 64317	643	9	4317	63339	22 63339	23 63339	24 63290
SR	0431/	0431/	043	1/ 6	110	03339	02222	46660	09290
	139100	74783	1040	6 4	86149	421832	358493	295154	231815
	139100	/4/85			86149	421852	308493	295154	25181:
NR PORec		1	5358						
	540000	-	5400	000					-
Componen		<i>:</i>		rr-211					
Part Name			: Cu	р					
Level			: 2						
Qty			: 1						
Lead Time	,			Veek					
Lot Sizing			: EO				- 1	2024	
Week			uary 202					ry 2024	
	25	26	2		28	29	30	31	32
GR	64806	64806	647	157	64757	63290	63290	63290	63290
SR	160525	10271	200	12	14166	440200	20/100	222010	25052
OHI	168525	10371		913 : 344	514156	449399	386109	322819	25952
NR				000					
PORec PORel	540000		540	000					
Componen		r		FR-211					
Part Name									
			: Cu	p					
Level			: 2	Р					
Qty			: 2 : 1	•					
Qty Lead Time	e		: 2 : 1 : 2 V	Veek					
Qty	e		: 2 : 1 : 2 V : EC	Veek)Q				2024	
Qty Lead Time	e 		: 2 : 1 : 2 V : EC urch 2024	Veek Q	26	27		2024	10
Qty Lead Time Lot Sizing Week	33	34	: 2 : 1 : 2 V : EC urch 2024	Veek VQ 5	36	37	38	39	40
Qty Lead Time Lot Sizing Week GR	e 		: 2 : 1 : 2 V : EC urch 2024	Veek Q	<u>36</u> 64953	37 63877			
Qty Lead Time Lot Sizing Week GR SR	33 65002	34 65002	: 2 : 1 : 2 V : EC urch 2024 2 649	Veek Q 5 953	64953	63877	38 63877	39 63877	63828
Qty Lead Time Lot Sizing Week GR GR SR OHI	33	34	: 2 : 1 : 2 V : EC urch 2024 2 649	Veek Q 5 953 235	64953 1282		38	39	63828
Qty Lead Time Lot Sizing Week GR SR OHI NR	33 65002	34 65002	: 2 : 1 : 2 V : EC urch 2024 2 649	Veek Q 5 953 235	64953 1282 63671	63877	38 63877	39 63877	63828
Qty Lead Time Lot Sizing Week GR GR SR OHI NR PORec	33 65002	34 65002 13123	: 2 : 1 : 2 V : EC urch 2024 3 2 649 7 662	Veek Q 5 953 235	64953 1282	63877	38 63877	39 63877	63828
Qty Lead Time Lot Sizing Week GR SR OHI NR PORec PORel	33 65002 196239	34 65002	: 2 : 1 : 2 V : EC rrch 2024 2 649 7 662 0	Veek 0Q 5 953 235	64953 1282 63671	63877	38 63877	39 63877	63828
Qty Lead Time Lot Sizing Week GR SR OHI NR PORec PORel Component	33 65002 196239	34 65002 13123	: 2 : 1 : 2 V : EC rrch 2024 2 649 7 662 0	Veek 0Q 5 953 235	64953 1282 63671	63877	38 63877	39 63877	63828
Qty Lead Time Lot Sizing Week GR SR OHI NR PORec PORel Component Part Name	33 65002 196239	34 65002 13123	: 2 : 1 : 2 V : EC rrch 2024 2 649 7 662 0 : WTR- : Cup	Veek 0Q 5 953 235	64953 1282 63671	63877	38 63877	39 63877	63828
Qty Lead Time Lot Sizing Week GR SR OHI NR PORec PORec PORel Component Part Name Level	33 65002 196239	34 65002 13123	: 2 : 1 : 2 V : EC rch 2024 3 2 649 7 662 7 662 7 : WTR-7 : Cup : 2	Veek 0Q 5 953 235	64953 1282 63671	63877	38 63877	39 63877	63828
Qty Lead Time Lot Sizing Week GR GR GR OHI NR PORec PORel Component Part Name Level Qty	33 65002 196239	34 65002 13123	: 2 : 1 : 2 V : EC rch 2024 3 2 649 7 662 7 662 7 : WTR-2 : Cup : 2 : 1	Veek 90 5 235 235 211	64953 1282 63671	63877	38 63877	39 63877	63828
Qty Lead Time Lot Sizing Week GR GR SR OHI NR PORec PORel Component Part Name Level Qty Lead Time	33 65002 196239	34 65002 13123	: 2 : 1 : 2 V : EC urch 2024 2 649 7 662 0 : WTR-2 : Cup : 2 : 1 : 2 Weel	Veek 90 5 235 235 211	64953 1282 63671	63877	38 63877	39 63877	63828
Qty Lead Time Lot Sizing Week GR GR GR OHI NR PORec PORel Component Part Name Level Qty	33 65002 196239	34 65002 13123 54000	: 2 : 1 : 2 V : EC urch 2024 2 : 649 7 662 7 662 0 : WTR-2 : Cup : 2 : 1 : 2 Weel : EOQ	Veek 90 5 235 235 211	64953 1282 63671	63877 476329	38 63877 412452	39 63877	63828
Qty Lead Time Lot Sizing Week GR GR SR OHI NR PORec PORel Component Part Name Level Qty Lead Time	33 65002 196239 t Number	34 65002 13123 54000	: 2 : 1 : 2 V : ECC rrch 2024 3 2 649 7 660 WTR-7 : Cup : 2 : 1 : 2 Weel : EOQ 2024	Veek 00 15 235 235 211 k	64953 1282 63671 540000	63877 476329 Jun	38 63877 412452 e 2024	39 63877 348575	63828
Qty Lead Time Lot Sizing Week GR SR OHI NR PORec PORel Component Part Name Level Qty Lead Time Lot Sizing Week	33 65002 196239 t Number	34 65002 13123 54000 May 2 42	: 2 : 1 : 2 V : ECC rch 2024 3 2 649 7 660 0 : WTR-7 : Cup : 2 : 1 : 2 Weel : ECQ 2024 43	Veek 9Q 5 235 211 k 44	64953 1282 63671 540000	63877 476329 Jun 46	38 63877 412452 e 2024 47	39 63877 348575	63828 28469
Qty Lead Time Lot Sizing Week GR SR SR OHI NR PORec PORel Component Part Name Level Qty Lead Time Lot Sizing Week GR	33 65002 196239 t Number	34 65002 13123 54000	: 2 : 1 : 2 V : ECC rrch 2024 3 2 649 7 660 WTR-7 : Cup : 2 : 1 : 2 Weel : EOQ 2024	Veek 00 15 235 235 211 k	64953 1282 63671 540000	63877 476329 Jun 46	38 63877 412452 e 2024	39 63877 348575	63828 28469
Qty Lead Time Lot Sizing Week GR SR OHI NR PORet Component Part Name Level Qty Lead Time Lot Sizing Week GR SR	33 65002 196239 t Number 41 65295	34 65002 13123 54000 May 2 42 65295	: 2 : 1 : 2 V : ECC rch 2024 32 65246	Veek QQ 5 235 235 211 k 44 65246	64953 1282 63671 540000 45 6485	63877 476329 Jun 46 5 64855	38 63877 412452 412452 e 2024 47 64855	39 63877 348575 	63828 28469 70tal 3.125.63
Qty Lead Time Lot Sizing Week GR GR OHI PORel Component PORel Component PORel Level Qty Lead Time Lot Sizing Week GR GR SR OHI Z	33 65002 196239 t Number	34 65002 13123 54000 May 2 42	: 2 : 1 : 2 V : ECC rch 2024 3 2 649 7 660 0 : WTR-7 : Cup : 2 : 1 : 2 Weel : ECQ 2024 43	Veek Q 5 235 235 235 211 k 44 65246 25034	64953 1282 63671 540000	63877 476329 Jun 46 5 64855	38 63877 412452 412452 e 2024 47 64855	39 63877 348575	63828 28469 70tal 3.125.63
Qty Lead Time Lot Sizing GR GR GR OHI NR PORel Component Porel Level Qty Lead Time Lot Sizing Week GR GR SR SR NR	33 65002 196239 t Number 41 65295	34 65002 13123 54000 May 2 42 65295	: 2 : 1 : 2 V : ECC rch 2024 32 65246	Veek 90 5 235 211 k 44 65246 25034 40212	64953 1282 63671 540000 45 6485 6485 49978	63877 476329 Jun 46 5 64855	38 63877 412452 412452 e 2024 47 64855	39 63877 348575 	63828 28469 Total 3.125.63
Qty Lead Time Lot Sizing Week GR GR OHI PORel Component PORel Component PORel Level Qty Lead Time Lot Sizing Week GR GR SR OHI Z	33 65002 196239 t Number 41 65295	34 65002 13123 54000 May 2 42 65295	: 2 : 1 : 2 V : ECC rch 2024 32 65246	Veek Q 5 235 235 235 211 k 44 65246 25034	64953 1282 63671 540000 45 6485 6485 49978	63877 476329 Jun 46 5 64855	38 63877 412452 412452 e 2024 47 64855	39 63877 348575 	63828

4. Lid cup

The following are the offsetting results for Lid cup.

Table 27. Lotting of lid cup

Compon	ent Number		: WTR-21		8		1	
Part Nan								
Level	le		: Lid Cup					
			: 2					
Qty								
Lead Tin			: 2 Week					
Lot Sizin	ıg		: EOQ					
Week			2023				st 2023	
	1	2	3	4	5	6	7	8
GR	63656	69452	69452	69403	67936	67936	67936	67887
SR								
OHI	691200	627544	558092	488640	419237	351301	283365	215429
NR								
PORec								
PORel								
Compone	ent Number		: WTR-21	3				
Part Nam	ıe		: Lid Cup					
Level			: 2					
Qty			:1					
Lead Tin	ne		: 2 Week					
Lot Sizin	ıg		: EOQ					
Week		Septem	ber 2023			Octob	er 2023	
week	9	10	11	12	13	14	15	16
GR	65442	65442	65393	65393	65393	65393	65393	65393
SR								
OHI	147542	82100	16658	3191265	3125872	3060479	2995086	2929693
NR			48735					
PORec			3240000					

	ent Numbe	r	: WTI								
Part Nam	ıe		: Lid	Cup							
Level			: 2								
Qty			: 1								
Lead Tin			: 2 W								
Lot Sizin	ıg		: EOQ								
Week			mber 202							er 2023	
WCCK	17	18	19		20		21		22	23	24
GR	64317	64317	64317	7 643	17	633	39	633	339	63339	63290
SR											
OHI	2864300	279998	3 27356	566 267	1349	260	7032	254	1693	2480354	2417015
NR											
PORec											
PORel			-								
	ent Numbe	r	: WTI								
Part Nam	le		: Lid (Cup							
Level			: 2								
Qty			: 1								
Lead Tin			: 2 W								
Lot Sizin	g		: EOC	2							
Week		Janu	ary 2024					F	Februar	y 2024	
WCCK	25	26	27		28	2	29		30	31	32
GR	64806	64806	6475	57 64	757	63	290	63	290	63290	63290
SR											
OHI	2353725	228891	9 22241	13 215	9356	209	4599	203	1309	1968019	1904729
NR											
PORec											
PORel											
		1									
			** 1007	2.040							
	ent Numbe	r	: WTI								
Part Nam		r	: Lid (
Part Nam Level		r	: Lid (: 2								
Part Nam Level Qty	ie	r	: Lid : 2 : 1	Cup							
Part Nam Level Qty Lead Tin	ne	r	: Lid (: 2 : 1 : 2 We	Cup eek							
Part Nam Level Qty	ne		: Lid (2 : 1 : 2 We : EOQ	Cup eek							
Part Nam Level Qty Lead Tim Lot Sizin	ne ne	Ma	: Lid : 2 : 1 : 2 W : EOQ rch 2024	Cup eek 2					April		
Part Nam Level Qty Lead Tin	ne ng 33	Ma 34	: Lid : 2 : 1 : 2 We : EOQ rch 2024 35	Cup eek	36		87		38	39	40
Part Nam Level Qty Lead Tim Lot Sizin	ne ne	Ma	: Lid : 2 : 1 : 2 We : EOQ rch 2024 35	Cup eek	36		37 877				40 63828
Part Nam Level Qty Lead Tin Lot Sizin Week	ne ng 33	Ma 34	: Lid : 2 : 1 : 2 We : EOQ rch 2024 35	Cup eek					38	39	
Part Nam Level Qty Lead Tin Lot Sizin Week GR	ne ng 33	Ma 34 65002	: Lid (: 2 : 1 : 2 W : EOQ rch 2024 35 6495	Cup eek 2 53 64		63		63	38 877	39	
Part Nam Level Qty Lead Tin Lot Sizin Week GR SR	ae 1g 33 65002	Ma 34 65002	: Lid (: 2 : 1 : 2 W : EOQ rch 2024 35 6495	Cup eek 2 53 64	953	63	877	63	38	39 63877	63828
Part Nam Level Qty Lead Tin Lot Sizin Week GR GR SR OHI NR	ae 1g 33 65002	Ma 34 65002	: Lid (: 2 : 1 : 2 W : EOQ rch 2024 35 6495	Cup eek 2 53 64	953	63	877	63	38 877	39 63877	63828
Part Nam Level Qty Lead Tim Lot Sizin Week GR GR SR OHI	ae 1g 33 65002	Ma 34 65002	: Lid (: 2 : 1 : 2 W : EOQ rch 2024 35 6495	Cup eek 2 53 64	953	63	877	63	38 877	39 63877	63828
Part Nam Level Qty Lead Tim Lot Sizim Week GR GR GR SR OHI NR <u>PORec</u> PORel	ne g 33 65002 1841439	Ma 34 65002	: Lid 0 : 2 : 1 : 2 Wo : EOQ rch 2024 35 6495 7 17114	Cup eek 2 53 64 135 164	953	63	877	63	38 877	39 63877	63828
Part Nam Level Qty Lead Tim Lot Sizin Week GR GR SR OHI NR <u>PORec</u> PORel Componer	ne 19 33 65002 1841439 1841439	Ma 34 65002	: Lid 0 : 2 : 1 : 2 W. : EOC rch 2024 35 6495 7 17114 : WTR-21	Cup eek 2 53 64 135 164	953	63	877	63	38 877	39 63877	63828
Part Nam Level Qty Lead Tim Lot Sizim Week GR GR SR OHI NR <u>PORec</u> PORel Componer	ne 19 33 65002 1841439 1841439	Ma 34 65002	: Lid (: 2 : 1 : 2 Wr : EOQ rch 2024 35 6495 7 17114 : WTR-21 : Lid Cup	Cup eek 2 53 64 135 164	953	63	877	63	38 877	39 63877	63828
Part Nam Level Qty Lead Tin Lot Sizin Week GR SR OHI NR <u>PORec</u> PORel Componer Part Name Level	ne 19 33 65002 1841439 1841439	Ma 34 65002	: Lid 0 : 2 : 1 : 2 Wi : EOQ rch 2024 35 6495 7 17114 : WTR-21 : Lid Cup : 2	Cup eek 2 53 64 135 164	953	63	877	63	38 877	39 63877	63828
Part Nam Level Qty Lead Tim Lot Sizin Week GR GR OH NR PORel Componer Part Name Level Qty	ae <u>8</u> <u>33</u> 65002 1841439 1841439	Ma 34 65002	: Lid 0 : 2 : 1 : 2 WTR-21 : 2 CO : 2	Cup eek 2 53 64 135 164	953	63	877	63	38 877	39 63877	63828
Part Nam Level Qty Lead Tin Lot Sizin Week GR GR SR OHI NR PORel PORel Componer Part Name Level Qty Lead Time	ne 18 65002 1841439 1841439	Ma 34 65002	: Lid 0 : 2 : 1 : 2 Wi : EOQ rch 2024 35 6495 7 17114 : WTR-21 : Lid Cup : 2	Cup eek 2 53 64 135 164	953	63	877	63	38 877	39 63877	63828
Part Nam: Level Qty Lead Tim Lot Sizin Week GR GR SR OH NR NR PORec PORel Componer Part Name Level Qty Lead Time Lot Sizing	ne 18 65002 1841439 1841439	Mai 34 65002 177643	: Lid 0 : 2 : 1 : 2 W(K): EOO rch 2024 35 6495 7 17114 : Lid Cup : 2 : UWTR-21 : Lid Cup : 2 : 1 : 2 Week : 2 Week : 2 Week	Cup eek 2 53 64 135 164	953	63	877	63	38 1877 7652	39 63877	63828 1389898
Part Nam Level Qty Lead Tin Lot Sizin Week GR GR SR OHI NR PORel PORel Componer Part Name Level Qty Lead Time	ne 18 65002 1841439 1841439	Ma 34 65002	: Lid 0 : 2 : 1 : 2 W(K): EOO rch 2024 35 6495 7 17114 : Lid Cup : 2 : UWTR-21 : Lid Cup : 2 : 1 : 2 Week : 2 Week : 2 Week	Cup eek 2 53 64 135 164	6482	63	877	63 151	38 1877 7652	39 63877	63828
Part Nam: Level Qty Lead Tim Lot Sizin Week GR GR SR OH NR NR PORec PORel Componer Part Name Level Qty Lead Time Lot Sizing	ne 19 65002 1841439 1841439	Ma 34 65002 177643	: Lid G : 2 : 1 : 2 Weik : EOQ rch 2024 35 6495 : 4495 : 1 : 1 : 2 Weik : 2 : 1 : 2 Weik : 2 : 1 : 2 Weik : 2 : 1 : 2 Weik : 2 We	Cup eek	6482	63	877 1529 Ju	63 151 me 20	38 1877 7652	39 63877 1453775	63828 1389898
Part Nam: Level Qty Lead Tim Lot Sizin Week GR GR SR OHI NR PORec PORel Componer Port Name Level Qty Lead Time Lot Sizing Week	ne 19 33 65002 1841439 1841439	Mai 34 65002 177643 177643	: Lid 0 : 2 : 1 : 2 WW : EOQ rch 2024 35 6495 6495 7 17114 : Lid Cup : 2 : 1 : 2 Week : EOQ 2024 43	Cup eek 53 64 435 164 3 3	6482	5	877 1529 	63 151 me 20	38 1877 7652 024 47	39 63877 1453775	63828 1389898
Part Nam: Level Qty Lead Tim Lot Sizin Week GR SR OHI NR PORel Componer Part Name Level Qty Lead Time Lot Sizing Week GR SR	18 19 33 65002 1841439 1841439 1841439 1841439 1841439 1841439 1841439	Mai 34 65002 177643 177643	: Lid 0 : 2 : 1 : 2 WW : EOQ rch 2024 35 6495 6495 7 17114 : Lid Cup : 2 : 1 : 2 Week : EOQ 2024 43	Cup eek 53 64 435 164 3 3	953 6482 4 641	5	877 1529 	63 151	38 1877 7652 024 47	39 63877 1453775 4453775 448 64855	63828 1389898
Part Nam: Level Qty Lead Tim Lot Sizin Week GR SR OHI NR PORel Componer Part Name Level Qty Lead Time Lot Sizing Week GR SR	18 19 33 65002 1841439 1841439 1841439 1841439 1841439 1841439 1841439	Mai 34 65002 177643 177643 May 2 42 65295	: Lid 0 : 2 : 1 : 2 W0 : EOQ rch 2024 35 6495 : WTR-21 : Lid Cup : 2 : Lid Cup : 2 : 1 : 2 W0 : EOQ : 2 : 1 : 2 W0 : EOQ : 2 : 4 : 2 W0 : 2 W0 : 495 : 495	Cup eek 23364 435164 435164 33 3	953 6482 4 641	63 158	877 1529 Ju 46 648	63 151	38 1877 7652 024 47 64855	39 63877 1453775 4453775 448 64855	63828 1389898 Total 3.125.632
Part Nam Level Qty Lead Tim Lot Sizin Week GR SR OHI NR PORec PORel Componer PORel Componer Port Nam Level Qty Lead Time Lot Sizing Week GR SR SR SR NR	18 19 33 65002 1841439 1841439 1841439 1841439 1841439 1841439 1841439	Mai 34 65002 177643 177643 May 2 42 65295	: Lid 0 : 2 : 1 : 2 W0 : EOQ rch 2024 35 6495 : WTR-21 : Lid Cup : 2 : Lid Cup : 2 : 1 : 2 W0 : EOQ : 2 : 1 : 2 W0 : EOQ : 2 : 4 : 2 W0 : 2 W0 : 495 : 495	Cup eek 23364 435164 435164 33 3	953 6482 4 641	63 158	877 1529 Ju 46 648	63 151	38 1877 7652 024 47 64855	39 63877 1453775 4453775 448 64855	63828 1389898 Total 3.125.632
Part Nam: Level Qty Lead Tin Lot Sizin Week GR SR OHI NR PORel PoRel Porel Componer Part Name Level Qty Lead Tim Level Qty Lead Tim PORec GR GR GR GR GR GR OHI OHI OHI OHI	18 19 33 65002 1841439 1841439 1841439 1841439 1841439 1841439 1841439	Mai 34 65002 177643 177643 May 2 42 65295	: Lid 0 : 2 : 1 : 2 W0 : EOQ rch 2024 35 6495 : WTR-21 : Lid Cup : 2 : Lid Cup : 2 : 1 : 2 W0 : EOQ : 2 : 1 : 2 W0 : EOQ : 2 : 4 : 2 W0 : 2 W0 : 495 : 495	Cup eek 23364 435164 435164 33 3	953 6482 4 641	63 158	877 1529 Ju 46 648	63 151	38 1877 7652 024 47 64855	39 63877 1453775 4453775 448 64855	63828 1389898 Total 3.125.632 79029692

Explosion

Explosion is the process of calculating MRP for items that are one level below, by calculating the gross needs based on the order plan prepared during the offsetting process at the top level, and then multiplying it by the number of item requirements. The following results are from the explosion process for items at levels 1 and 2.

1. Cardboard and cardboard divider Here are the results of MRP on cardboard and cardboard divider.

Table 28. Result of MRP on cardboard and cardboard divider

Compon	ent Nu	nber		R-111 & 1								
Part Nar	ne		: Card	board an	d Cardbo	ard divid	ler					
Level			: 1									
Qty			: 1									
Lead Ti	me		: 2 We	eek								
Lot Sizi	ng		: EOQ	2								
Week		July	2023			August	t 2023		;	Septemi	oer 2023	3
week	1	2	3	4	5	6	7	8	9	10	11	12
GR	1302	1420	1420	1419	1389	1389	1389	1388	1338	1338	1337	1337
SR												
OHI	4680	3378	1958	538	14119	12730	11341	9952	8564	7226	5888	4551
NR				881								
PORec				15000								
PORel		15000										

Compon		aber			WTR-								
Part Nan	ne			board a	nd Card	board d	ivider						
Level			: 1										
Qty			: 1										
Lead Tir			: 2 We										
Lot Sizit	ıg		: EOQ										
Week		Octo	ber 2023					r 2023				ber 202	
WOCK	13	14	15	16			8	19	20	21	22	23	24
GR	1337	1337	1337	133	7 13	15 13	315	1315	1315	1295	1295	1295	1294
SR													
OHI	3214	1877	540	1420	3 128	66 11	551	10236	8921	7606	6311	5016	3721
NR			797										
PORec			15000	1									
PORel	15000)											15000
Compon	ent Nur	nher	· WT	R-111.8	WTR-	112							
Part Nar		aou			and Card		livider						
Level			· 1		uio cuit								
Otv			:1										
Lead Tit	ne		: 2 W	ook									
Lot Sizi			: EOC										
	18	Tanu	arv 2024			Fe	bruarv	2024			Marc	h 2024	
Week	25	26	33	33	3		33	31	32	33	34	35	36
GR	1325	1325					329	1294	1294	1329	1329	1328	1328
SR	1525	1525	1525	1.52				1251	1251	1525	1525	1520	1520
OHI	2427	1102	14777	134	53 12	129 10	0835	9541	8247	6953	5624	4295	2967
NR	2127	223		1.51			/055	2211	0217	0755	5021	1235	2507
PORec		15000)	-			-						
PORel		15000	/	-		_							15000
					/TR-112								15000
Compone Part Nam		ber			Cardboa								
Level	e		: Cardoo	ard and	Cardooa	ra aivia	er						
Qtv			:1										
Lead Tin	1e		· 2 Weel	-									
Lot Sizin			: EOO										
	<u> </u>	April				May	2024			June	2024		
Week	37	38	39	40	41	42	43	44	45	46	47	48	Total
GR	1306	1306	1306	1305	1335	1335	1334	1 1334	1326	1326	1326	1326	63.906
SR													
OHI	1639	333	14027	12721	11416	10081	8746	5 7412	2 6078	4752	3426	2100	346068
NR		973									-		
PORec		15000					1	1					60000
PORel													60000

 220 ml Bottled Water Here are the results of MRP on 220 ml Bottled Water.

Table 29. Result of MRP on 220 ml bottled water

	ent Number		: WTR-11					
Part Nam	le			Bottled Wate	er			
Level			:1					
Qty			: 48					
Lead Tim			: -					
Lot Sizin	g		:-					
Week		July		4		Augus	t 2023	
6D	1	2	3		5	6	7	8
GR	63681	69452	69452	69403	67936	67936	67936	67887
SR								
OHI	25							
NR	63656	69452	69452	69403	67936	67936	67936	67887
PORec	63656	69452	69452	69403	67936	67936	67936	67887
PORel	63656	69452	69452	69403	67936	67936	67936	67887
Compone	ent Number		: WTR-11	3				
Part Nam	ie		: 220 ml E	Bottled Wate	er			
Level			:1					
Qty			: 48					
Lead Tin	1e		:-					
Lot Sizin	g		1.4					
7771-		Septemb	ber 2023			Octobe	er 2023	
Week	9	10	11	12	13	14	15	16
GR	65442	65442	65393	65393	65393	65393	65393	65393
SR								
OHI								
NR	65442	65442	65393	65393	65393	65393	65393	65393
PORec	65442	65442	65393	65393	65393	65393	65393	65393
PORel	65442	65442	65393	65393	65393	65393	65393	65393
	1							
	ent Number		: WTR-1					
Part Nam	10							
	10			Bottled Wat	er			
Level			:1	Bottled Wat	er			
Qty			: 1 : 48	Bottled Wat	er			
Qty Lead Tin	ne		:1	Bottled Wat	er			
Qty	ne		: 1 : 48 : - : -	Bottled Wat	er			
Qty Lead Tin	ne g		: 1 : 48 : - : - ber 2023				ber 2023	
Qty Lead Tin Lot Sizin Week	ne 19 17	18	: 1 : 48 : - : - ber 2023 19	20	21	22	23	24
Qty Lead Tim Lot Sizin Week GR	ne g		: 1 : 48 : - : - ber 2023					24 63290
Qty Lead Tim Lot Sizin Week GR SR	ne 19 17	18	: 1 : 48 : - : - ber 2023 19	20	21	22	23	
Qty Lead Tin Lot Sizin Week GR GR SR OHI	10 17 64317	18 64317	: 1 : 48 : - : - ber 2023 19 64317	20 64317	21 63339	22 63339	23 63339	63290
Qty Lead Tin Lot Sizin Week GR GR SR OHI NR	ne g 64317 64317	18 64317 64317	: 1 : 48 : - : - ber 2023 19 64317 64317	20 64317 64317	21 63339 63339	22 63339 63339	23 63339 63339	63290 63290
Qty Lead Tim Lot Sizin Week GR SR OHI NR PORec	17 64317 64317 64317	18 64317 64317 64317	: 1 : 48 : - : - ber 2023 19 64317 64317 64317	20 64317 64317 64317	21 63339 63339 63339	22 63339 63339 63339	23 63339 63339 63339	63290 63290 63290
Qty Lead Tin Lot Sizin Week GR GR SR OHI NR	ne g 64317 64317	18 64317 64317	: 1 : 48 : - : - ber 2023 19 64317 64317	20 64317 64317	21 63339 63339	22 63339 63339	23 63339 63339	63290 63290
Qty Lead Tim Lot Sizim Week GR SR OHI NR <u>PORec</u> PORel	17 64317 64317 64317 64317 64317	18 64317 64317 64317 64317	: 1 : 48 :- :- ber 2023 64317 64317 64317 64317	20 64317 64317 64317 64317	21 63339 63339 63339	22 63339 63339 63339	23 63339 63339 63339	63290 63290 63290
Qty Lead Tim Lot Sizim Week GR SR OHI NR <u>PORec</u> PORel Compone	17 64317 64317 64317 64317 64317 64317 ent Number	18 64317 64317 64317 64317	: 1 : 48 : - : - : - : - : - : - : - : - : - : -	20 64317 64317 64317 64317 13	21 63339 63339 63339 63339	22 63339 63339 63339	23 63339 63339 63339	63290 63290 63290
Qty Lead Tim Lot Sizin Week GR SR OHI NR PORec PORel Compone Part Nam	17 64317 64317 64317 64317 64317 64317 ent Number	18 64317 64317 64317 64317	: 1 : 48 : - : - : - : - : - : - : - : -	20 64317 64317 64317 64317	21 63339 63339 63339 63339	22 63339 63339 63339	23 63339 63339 63339	63290 63290 63290
Qty Lead Tim Lot Sizim Week GR SR OHI NR PORec PORel Compone Part Nam Level	17 64317 64317 64317 64317 64317 64317 ent Number	18 64317 64317 64317 64317	: 1 : 48 :- ber 2023 19 64317 64317 64317 64317 : WTR-11 : 220 ml J : 1	20 64317 64317 64317 64317 13	21 63339 63339 63339 63339	22 63339 63339 63339	23 63339 63339 63339	63290 63290 63290
Qty Lead Tin Lot Sizin Week GR SR OHI NR <u>PQRec</u> PORel Compone Part Nam Level Qty	17 64317 64317 64317 64317 64317 ent Number ie	18 64317 64317 64317 64317	: 1 : 48 :- ber 2023 19 64317 64317 64317 64317 : WTR-1 : 220 ml 1 : 1 : 48	20 64317 64317 64317 64317 13	21 63339 63339 63339 63339	22 63339 63339 63339	23 63339 63339 63339	63290 63290 63290
Qty Lead Tin Lot Sizin Week GR SR OHI NR PORel Compone Part Nam Level Qty Lead Tim	17 64317 64317 64317 64317 64317 64317 ent Number 1e	18 64317 64317 64317 64317	: 1 : 48 :- ber 2023 19 64317 64317 64317 64317 : WTR-11 : 220 ml J : 1	20 64317 64317 64317 64317 13	21 63339 63339 63339 63339	22 63339 63339 63339	23 63339 63339 63339	63290 63290 63290
Qty Lead Tin Lot Sizin Week GR SR OHI NR PORel Compone Part Nam Level Qty Lead Tin Lot Sizin	17 64317 64317 64317 64317 64317 64317 ent Number 1e	18 64317 64317 64317 64317	: 1 : 48 :- ber 2023 19 64317 64317 64317 64317 : WTR-1: : 220 m I : 1 : 48 :- : -	20 64317 64317 64317 64317 13	21 63339 63339 63339 63339	22 63339 63339 63339 63339	23 63339 63339 63339 63339	63290 63290 63290
Qty Lead Tin Lot Sizin Week GR SR OHI NR PORel Compone Part Nam Level Qty Lead Tim	17 64317 64317 64317 64317 64317 64317 ent Number le	18 64317 64317 64317 64317 7	: 1 : 48 :- :- :- 64317 64317 64317 64317 : WTR-1: : 220 ml J : 1 : 48 :- :- y 2024	20 64317 64317 64317 64317 3 3 3 ottled Wat	21 63339 63339 63339 63339 er	22 63339 63339 63339 63339 63339	23 63339 63339 63339 63339	63290 63290 63290 63290
Qty Lead Tin Lot Sizin Week GR SR OHI NR PORel PORel Compone Part Nam Level Qty Lead Tim Lot Sizin	17 64317 64317 64317 64317 64317 64317 64317 64317 10 9 9 10 9 9 25	18 64317 64317 64317 64317 64317 64317 Januar 26	: 1 : 48 :- :- :- :- :- :- :- : : : : : : : : :	20 64317 64317 64317 64317 3 3 3 3 3 3 3 3 3 3 3 3 2 8	21 63339 63339 63339 63339 er 29	22 63339 63339 63339 63339 63339 63339	23 63339 63339 63339 63339 63339 ry 2024 31	63290 63290 63290 63290 32
Qty Lead Tin Lot Sizin Week GR SR OHI NR PORel Compone Part Nam Level Qty Lead Tin Lot Sizin Week GR	17 64317 64317 64317 64317 64317 64317 ent Number le	18 64317 64317 64317 64317 7	: 1 : 48 :- :- :- 64317 64317 64317 64317 : WTR-1: : 220 ml J : 1 : 48 :- :- y 2024	20 64317 64317 64317 64317 3 3 3 ottled Wat	21 63339 63339 63339 63339 er	22 63339 63339 63339 63339 63339	23 63339 63339 63339 63339	63290 63290 63290 63290
Qty Lead Tin Lot Sizim Week GR SR OHI NR PORel PORel Compone Part Nam Level Qty Lead Tim Lot Sizim Week GR SR	17 64317 64317 64317 64317 64317 64317 64317 64317 10 9 9 10 9 9 25	18 64317 64317 64317 64317 64317 7 64317 7 3 4 3 10 10 10 10 10 10 10 10 10 10 10 10 10	: 1 : 48 :- :- :- :- :- :- :- : : : : : : : : :	20 64317 64317 64317 64317 3 3 3 3 3 3 3 3 3 3 3 3 2 8	21 63339 63339 63339 63339 er 29	22 63339 63339 63339 63339 63339 63339	23 63339 63339 63339 63339 63339 ry 2024 31	63290 63290 63290 63290 32
Qty Lead Tim Lot Sizin Week GR SR OHI NR PORel Compose Port Nam Level Qty Lead Tim Lot Sizin Week GR SR OHI	ne 17 64317 64317 64317 64317 64317 64317 10 10 10 10 10 10 10 10 10 10	18 64317 64317 64317 64317 64317 64317 5 7 64317 5 64317	: 1 : 48 :- :- :- :- :- :- :- :- :- :-	20 64317 64317 64317 64317 33 30 ttled Wat	21 63339 63339 63339 63339 er 29 63290	22 63339 63339 63339 63339 63339 63339 53339 Februa 30 63290	23 63339 63339 63339 63339 63339 63339 63339 63339	63290 63290 63290 63290 63290 63290 32 63290
Qty Lead Tin Lot Sizin Week GR OHI NR PORel Compone PORel Compone Part Nam Level Qty Lead Tin Lot Sizin Week GR SR OHI NR	ne 17 64317 64317 64317 64317 64317 64317 ant Number 10 8 25 64806 64806	18 64317 64317 64317 64317 64317 64317 7 64317 7 64317 64317 64316 64306	: 1 : 48 :- :- :- :- :- :- :- : : : : : : : : :	20 64317 64317 64317 64317 33 30ttled Wat 28 64757 64757	21 63339 63339 63339 63339 63339 er 29 63290	22 63339 63339 63339 63339 63339 63339 63339 63290 63290	23 63339 63339 63339 63339 63339 63339 ry 2024 31 63290	63290 63290 63290 63290 63290 63290 63290 63290
Qty Lead Tim Lot Sizin Week GR SR OHI NR PORel Compose Port Nam Level Qty Lead Tim Lot Sizin Week GR SR OHI	ne 17 64317 64317 64317 64317 64317 64317 10 10 10 10 10 10 10 10 10 10	18 64317 64317 64317 64317 64317 64317 5 7 64317 5 64317	: 1 : 48 :- :- :- :- :- :- :- :- :- :-	20 64317 64317 64317 64317 33 30 ttled Wat	21 63339 63339 63339 63339 er 29 63290	22 63339 63339 63339 63339 63339 63339 53339 Februa 30 63290	23 63339 63339 63339 63339 63339 63339 63339 63339	63290 63290 63290 63290 63290 63290 32 63290

-										
	ent Numb	er	: WTI							
Part Nan	ne			ml Bottle	d Wat	er.				
Level			: 1							
Qty			: 48							
Lead Tir	ne		1 -							
Lot Sizir	ng		: -							
	Г — Т	Ma	rch 2024					April	2024	
Week	33	34	35		6	3	7	38	39	40
GR	65002	65002	6495	53 64	953	63	877	63877	63877	63828
SR										
OHI										
NR	65002	65002	6495	53 64	953	63	877	63877	63877	63828
PORec	65002	65002	6495	53 64	953	63	877	63877	63877	63828
PORel	65002	65002	649	53 64	953	63	877	63877	63877	63828
Compone	nt Number		: WTR-11	3						
Part Nam	e		: 220 ml H	Bottled Wa	ter					
Level			:1							
Qty			: 48							
Lead Tim	e		1 -							
Lot Sizin	g		1.4							
Week		May						e 2024		Total
	41	42	43	44		5	46	47	48	
GR	65295	65295	65246	65246	64	855	64855	64855	64855	3.125.657
SR										
OHI										25
NR	65295	65295	65246	65246	64		64855	64855		3.125.632
PORec	65295	65295	65246	65246	64		64855	64855		3.125.632
PORel	65295	65295	65246	65246	64	855	64855	64855	64855	3.125.632

3. Straw

Here are the results of MRP on Straw.

	Ta	ble 3). Res	ult of	MRP	on str	aw	
Part Nan Level Qty Lead Tin	ne		: WTR-11 : Straw : 1 : 48 : 2 Week	4				
Lot Sizir	g	T. 1 /	: EOQ				1 2022	
Week		July			6		t 2023	0
OB	1 62496	2	3 68160	4 68112	5 66672	6	/	8
GR	62496	68160	08160	08112	00072	66672	66672	66624
SR OHI	366000	303504	235344	167184	99072	32400	1465728	1399056
NR	300000	303304	255544	10/184	99072	34272	1405728	1399000
PORec						1500000		
PORel				1500000		1300000		
Compon Part Nan	ent Number		: WTR-11 : Straw	14				
Level	ne		: Straw					
Qty			: 48					
Lead Tir			: 48 : 2 Week					
Lead III Lot Sizir			: EOQ					
	lig	Santam	ber 2023			Octob	er 2023	
Week	9	10	11	12	13	14	15	16
GR	64224	64224	64176	64176	64176	64176	64176	64176
SR	04224	04224	04170	04170	04170	04170	04170	04170
OHI	1332432	1268208	1203984	1139808	1075632	1011456	947280	883104
NR	1552452	1200200	1203904	1159000	1075052	1011450	947200	005104
PORec								
PORel								
Compon Part Nan	ent Number		: WTR-11	.4				
Level	10		: Straw					
Qty			· 48					
Lead Tin			: 2 Week					
Leau Th			: EOQ					
		Novemi	per 2023			Decemi	per 2023	
Week	17	18	19	20	21	22	23	24
GR	63120	63120	63120	63120	62160	62160	62160	62112
SR	05120	05120	05120	05120	02100	02100	02100	02112
OHI	818928	755808	692688	629568	566448	504288	442128	379968
NR	010720	155000	072000	023300	500110	501200	TIETEO	5.7700
PORec								
PORel								
	ent Number		: WTR-11	.4				
Part Nan Level	10		: Straw : 1					
Otv			: 48					
Lead Tin	na		: 40 : 2 Week					
Lead Th Lot Sizir			: EOQ					
		Tanuar	v 2024			Februa	rv 2024	
Week	25	26	27	28	29	30	31	32
GR	63600	63600	63552	63552	62112	62112	62112	62112
SR	03000	05000	00000	05552	02112	02112	02112	02112
OHI	317856	254256	190656	127104	63552	1440	1439328	1377216
NR	517050	237230	170050	12/104	05552	60672	137528	15//210
PORec						1500000		
PORel				150000				
1 01001	1	1		1 100000			1	1

Compone	ent Number		: WTR-11	.4				
Part Nam			: Straw					
Level			:1					
Qty :48								
Lead Tin	Lead Time : 2 Week							
Lot Sizin	Lot Sizing : EOQ							
Week			1 2024		April 2024			
week	33	34	35	36	37	38	39	40
GR	63792	63792	63744	63744	62688	62688	62688	62640
SR								
OHI	1315104	1251312	1187520	1123776	1060032	997344	934656	871968
NR								
PORec								
PORel								

Component Number : WTR-114									
Part Nan	ıe		: Straw						
Level			:1						
Qty			: 48						
Lead Time : 2 Week									
Lot Sizing : EOQ									
Week	[May	2024		June 2024				Total
week	41	42	43	44	45	46	47	48	Total
GR	64080	64080	64032	64032	63648	63648	63648	63648	3067488
SR									
OHI	809328	745248	681168	617136	553104	489456	425808	326160	3491654
NR									
PORec									3000000
PORel									3000000

4. Cup

Here are the results of MRP on Cup.

Table 31. Result of MRP on cup

0		able			in oi	WIN	onc	up		
Compon Part Nan	ent Numbe ne	r	: W1 : Cuj	R-211						
Level			: 2	2						
Qty			: 1							
Lead Tin Lot Sizir	ne 10		: 2 W : EO							
Week	* 5	Jul	y 2023	×			Augus	t 2023		
moon	1	2	3		4	5	6	7	8	
GR SR	63656	69452 540000	694	52 6	9403	67936	67936	67936	67887	
OHI	126000	62344	532	892 4	63440	394037	326101	258165	190229	
NR	120000	02511	552		05110	551057	520101	250105	170225	
PORec										
PORel	(37.1								540000	
Part Nan	ent Numbe ne	ť	: W I : Cuj	R-211						
Level			: 2							
Qty Land Tim			:1 :2 V	71-						
Lead Tin Lot Sizir			: EO							
Week			nber 20	23				er 2023		
	9	10	1		12	13	14	15	16	
GR SR	65442	65442	653	93 e	5393	65393	65393	65393	65393	
OHI	122342	56900	531	458 4	66065	400672	335279	269886	204493	
NR		8542								
PORec		540000							<u> </u>	
PORel		1		TR-211					1	
Compon Part Nan	ent Numbe	r	: W : Cu							
Level			: 2	r						
Qty			: 1							
Lead Tin Lot Sizir			: 2 V : EC	Veek						
Week	lg	Nove	mber 20				Decem	ber 2023		
	17	18	1	9	20	21	22	23	24	
GR	64317	64317	643	17 64	4317	63339	63339	63339	63290	
SR OHI	139100	74783	1040	56 4	86149	421832	358493	295154	231815	
NR	155100	74705	5358		50145	421052	550455	275154	251015	
PORec			5400	000						
PORel	540000									
Compon Part Nan	Component Number : WTR-211 Part Name : Cup									
Level	Ie		: 2	þ						
Qty			: 1							
Lead Tin			: 2 V : EO	Veek						
Lot Sizin		Janu	ary 202				Februa	ry 2024		
Week	25	26	2	7	28	29	30	31	32	
GR	64806	64806	647	757 (54757	63290	63290	63290	63290	
SR OHI	168525	103719	389	013 5	14156	449399	386109	322819	259529	
NR	100525	105/15	258		14150	477577	500105	522017	237527	
PORec			540							
PORel	540000									
	ent Numbe	r		FR-211						
Part Nan Level	ne		: Cu : 2	р						
Qty			:1							
Lead Tir			:2 \	Veek						
Lot Sizir	ng	1/	: EC				40-1	2024		
Week	33	34	ren 2024 3		36	37	38 April	39	40	
GR	65002	65002	649		54953	63877	63877	63877	63828	
SR										
OHI NR	196239	131237	662		1282 53671	476329	412452	348575	284698	
PORec					40000					
PORel		540000								
Compone	ent Number		: WTR-2	211						
Part Nam	ie		: Cup							
Level Qty			: 2 : 1							
Qty :1 Lead Time :2 Week										
Lead Tim			Lot Sizing : EOQ							
Lead Tim						Iun	e 2024		Total	
Lead Tim	8	May 2						40		
Lead Tin Lot Sizin Week	g 41	42	43	44	45	46	47	48 64855		
Lead Tim Lot Sizin Week GR SR	8 41 65295	42 65295	43 65246	65246	6485	46 5 64855	47 64855	64855	3.125.632	
Lead Tim Lot Sizin Week GR SR OHI	g 41	42	43	65246 25034		46 5 64855	47			
Lead Tim Lot Sizin Week GR GR SR OHI NR	8 41 65295	42 65295	43 65246	65246 25034 40212	6485	46 5 64855	47 64855	64855	3.125.632 13.020.092	
Lead Tim Lot Sizin Week GR SR OHI	8 41 65295	42 65295	43 65246	65246 25034	6485	46 5 64855	47 64855	64855	3.125.632	

5. Lid Cup

Here are the results of MRP on Lid cup.

Table 32. Result of MRP on lid cup										
Compone	Component Number : WTR-213									
Part Nam	le		: Lid Cup							
Level			:2							
Qty			:1							
Lead Tin	ne		: 2 Week							
Lot Sizin	Lot Sizing : EOQ									
	0	July				Augus	st 2023			
Week	1	2	3	4	5	6	7	8		
GR	63656	69452	69452	69403	67936	67936	67936	67887		
SR										
OHI	691200	627544	558092	488640	419237	351301	283365	215429		
NR										
PORec										
PORel										
	ent Number		: WTR-21	3						
Part Nam			: Lid Cup	-						
Level			: 2							
Otv			:1							
Lead Tin	1e		2 Week							
Lot Sizin			: EOQ							
	0	Septemb				Octob	er 2023			
Week	9 10 11 12				13	14	15	16		
GR	65442	65442	65393	65393	65393	65393	65393	65393		
SR	05112	05112	05575	05575	05575	05575	05575	05555		
OHI	147542	82100	16658	3191265	3125872	3060479	2995086	2929693		
NR	147542	02100	48735	5171205	5125072	5000475	2775000	2727075		
PORec			3240000							
PORel	3240000		3240000							
	ent Number		: WTR-2							
Part Nam	le		: Lid Cup							
Level			: 2							
Qty			:1							
Lead Tin			: 2 Week							
Lot Sizin	8		: EOQ			-				
Week	17		ber 2023				ber 2023			
	17	18	19	20	21	22	23	24		
GR	64317	64317	64317	64317	63339	63339	63339	63290		
SR										
OHI	2864300	2799983	2735666	2671349	2607032	254693	2480354	2417015		
NR										
PORec										
PORel			1	1	1	1				

Table 32. Result of MRP on lid cup

0	(37.1			0.010							
	ent Numb	er		R-213							
Part Nan	ne			: Lid Cup							
Level			: 2								
Qty			: 1								
Lead Tir			: 2 W								
Lot Sizit	ng		: EOC								
Week			uary 2024	y 2024					ry 2024		
WCCK	25	26	27	2	8	- 2	29	30	31	32	
GR	64806	64800	647	57 642	757	63	290	63290	63290	63290	
SR.											
OHI	235372	5 22889	9 2224	113 2159	9356	209	4599	2031309	1968019	1904729	
NR											
PORec											
PORel											
Compon	ent Numb	er	· W/T	R-213					1		
Part Nar		C1									
Level											
	Qty :1 Lead Time :2 Week										
Lot Sizi	ng		: EOC	2							
Week			arch 2024				- 1		2024		
	33	34	35				37	38	39	40	
GR	65002	65002	2 6493	53 649	953	63	877	63877	63877	63828	
SR											
OHI	184143	9 177643	37 17114	435 1646	5482	158	1529	1517652	1453775	1389898	
NR											
PORec											
PORel											
Compone	nt Number		: WTR-21	3							
Part Nam			: Lid Cup								
Level			:2								
Qty			:1								
Lead Tim	ie		: 2 Week								
Lot Sizing			: EOQ								
Week	<u> </u>	May						ine 2024		Total	
week	41	42	43	44	4.		46		48		
GR	65295	65295	65246	65246	648	55	648	55 64855	64855	3.125.632	
SR											
OHI	1326070	1260775	1195480	1130234	1064	988	10001	133 93527	8 870423	79029692	
NR											
PORec										3240000	
PORel										3240000	

Total Cost of Inventory

After the MRP process, the total inventory cost is calculated using the EOQ method, taking into account shipping capacity constraints and company policies. The following represents the total inventory cost calculated with the EOQ method, considering shipping capacity constraints.

Table 33. Total cost of inventory with EOQ) method shipping capacity constrains
--	---------------------------------------

Description	Purchase cost	Ordering cost	Holding cost	Total				
Cardboard and	IDR222.097.500	IDR 40.056.522	IDR 4.958.877	IDR 267.112.900				
Cardboard divider	IDR222.077.500	IDR 40.050.522	IDR 4.750.077	IDR 207.112.900				
Straw	IDR 35.119.344	IDR 11.028.261	IDR 684.025	IDR 46.831.630				
Cup	IDR 231.205.408	IDR 35.703	IDR 785.608	IDR 232.026.718				
Lid Cup	IDR 81.529.500	IDR 5.014.131	IDR 582.279	IDR 87.125.910				
	Total							

Then, calculate total cost of inventory with company's policy

Table 33. Total cost of inventory with company's policy

Description	Purchase cost	Ordering cost	Holding cost	Total
Cardboard and Cardboard divider	IDR222.097.500	IDR 51.084.784	IDR 3.311.020	IDR 276.493.303
Straw	IDR35.119.344	IDR 12.570.653	IDR 256.957	IDR 47.946.954
Cup	IDR 231.205.408	IDR 35.703	IDR 785.607	IDR 232.026.718
Lid Cup	IDR 81.529.500	IDR 6.042.392	IDR 175.257	IDR 87.747.149
	IDR644.214.124			

The research conducted will be beneficial for the bottled drinking water industry, particularly at PT XYZ, in making purchasing decisions for packaging raw materials. This will lead to obtaining optimal inventory calculations for the 220 ml bottled drinking water packaging materials at PT XYZ.

5. CONCLUSION

After processing the data, it can be concluded that the optimal order quantity, as determined by the EOQ method with constraints on the shipping capacity for each packaging raw material. Specifically, 15.000 pcs for cardboard and cardboard dividers, resulting in an inventory cost of IDR 267.112.900, 1.500.000 pcs for straws, with an inventory cost of IDR46.831.630, 540.000 pcs for cups, incurring an inventory cost of IDR232.026.718, and 150 rolls for cup lids, with an inventory cost of IDR87.125.910. The total inventory cost for the raw materials used for 220 ml bottled dringking water (AMDK) is Rp633.097.158. Then, the EOQ method with constain on the shipping capacity results in the following ordering frequencies for each packaging raw material is four orders for cardboard and cardboard dividers, scheduled for weeks 2, 13, 24, and 36. Two orders for straws, to be placed in weeks 4 and 28. Five orders for cups, with orders scheduled for weeks 8, 17, 25, 34, and 42 and One order for cup lids, only in week 9.

Based on calculations performed using the EOO method with constraints on the shipping capacity, accounting for shipping capacity constraints and company policies, it has been determined that the EOQ method with constraints on the shipping capacity leads to a lower total inventory cost compared to the company's policy, resulting in cost savings of IDR11.116.966. The EOQ method with shipping capacity constraints results in a lower total inventory cost, mainly because it involves a reduced order frequency compared to the company's policy. For cardboard items, the EOO method necessitates ordering four times, whereas the company's policy requires six orders. Meanwhile, for cup items, both the EOQ method and the company policy have a similar order frequency of four times, each with an order quantity of 540.000 cups. This similarity arises from the fact that shipping costs are not incurred by the company, allowing the optimal order quantity to be based on the supplier's minimum purchase requirement. In the case of straw items, the EOQ method leads to two

orders, while the company policy requires five. For cup lids, the EOQ method results in a single order, while the company policy calls for three. The next research is expected to utilize lot sizing methods in the lotting calculation process within MRP.

REFERENCES

- Aprilia, A., Sidik, M.D., & Fujiyanti, L. (2018). Sistem Penunjang Keputusan Persediaan Produksi Grafika dengan Pendekatan Economic Order Quantity (EOQ). *Jurnal Pasti*, 12(1), 34-49. https://publikasi.mercubuana.ac.id/index .php/pasti/article/view/2801
- Aritantia, Y., Sumantri, Y., & Yuniarti, R. (2018). Perencanaan Persediaan Material Berdasarkan Integrasi Distribution Requirement Planning dan Material Requirement Planning pada PT PLN. Jurnal Rekayasa dan Manajemen Sistem Industri, 6(2), 411–421. http://jrmsi.studentjournal.ub.ac.id/index .php/jrmsi/article/view/979
- Aspadin. (2021). Volume Produksi AMDK di Indonesia Tahun 2010-2019 [PowerPoint slides].
- Assifa, A. H., dan Pujiyanto, E. (2022). Perencanaan Pengendalian Kebutuhan Bahan Baku Menggunakan Metode MRP di PT XYZ. Seminar dan Konferensi Nasional IDEC 2022.
- Direktorat Jenderal Pelayanan Kesehatan. (2023,Jan). Penuhi Kebutuhan Air Putihmu Setiap Hari. https://yankes.kemkes.go.id/view_artike l/2035/penuhi-kebutuhan-air-putihmusetiap-hari
- Eunike, A., Herdianto, B., & Setyanto, N. W. (2017). Perencanaan Kebutuhan Bahan Baku Dengan Validasi Capacity Requirement Planning (CRP) Pada Perusahaan Rokok Sigaret Keretek Mesin (SKM). *Prosiding SNTI dan SATELIT 2017*, 114-120.
- Eunike, A., Setyanto, N. W., Yuniarti, R., Hamdala, I., Lukodono, R. P., & Fanani, A. A. (2018). Perencanaan produksi dan pengendalian persediaan. Malang: UB Press.

- Kadim. (2017). Penerapan Manajemen Produksi & Operasi Di Industri Manufaktur. Jakarta: Mitra Wacana Media.
- Kemenperin. (2019, Feb). Peluang Industri AMDK Mengalir Deras di Tahun Politik. https://kemenperin.go.id/artikel/20354/
- Mubin, A., Syahril, F. ., & Rosiani, T. Y. (2021). Sustainable EOQ Model with Multi Container Transportation Problems. *Jurnal Teknik Industri*, 22(2), 236–244. https://doi.org/10.22219/JTIUMM.Vol2 2.No2.236-244
- Persyaratan Teknis Industri Air Minum Dalam Kemasan, Peraturan Menteri Perindustrian Republik Indonesia Nomor 96 Tahun 2011(2011). https://kemenperin.go.id/jawaban_attach ment.php?id=554&id_t=5055
- Refangga, M. A., Gusminto, E. B., & Musmedi,
 D. P. (2018). Analisis Pengendalian
 Kualitas Produk Air Minum Dalam
 Kemasan dengan Menggunakan
 Statistical Process Control (SPC) dan
 Kaizen Pada PT. Tujuh Impian Bersama
 Kabupaten Jember. *Ekonomi Bisnis Dan*Akuntansi (E-journal), 5(2), 164.
 https://doi.org/10.19184/ejeba.v5i2.8678

- Setiawan, M. D., Wahono, B., dan ABS, M. K. (2020). Analisis Penerapan Material Requirement Planning (MRP) dalam Upaya Mengendalikan Bahan Baku (Studi Kasus pada CV Tirta Indo Megah). E-JRM: Elektronik Jurnal Riset Manajemen. 9 (24).
- Silfiani, I., Kuncoro, D. K. R., & Sitania, F. D. (2021) Planning and Controlling Raw Materials Using The Material Requirements Planning Method. *Jurnal Sains dan Teknologi*. 17(2), pp 131-137. https://jim.unisma.ac.id/index.php/jrm/ar ticle/viewFile/8442/6999
- Utama, R. E., Gani, N. A., Jaharuddin & Priharta, A. (2019). *Manajemen Operasi*. Tangerang Selatan: UM Jakarta Press.
- Vikaliana, R., Sofian, Y., Solihati, N., Adji, D. B., & Maulia, S. S. (2020). *Manajemen Persediaan*. Bandung: Media Sains Indonesia.