

D4 Materials management – Solutions

1

- a The magic triangle consists of the following components, which are all the goals of materials management at the same time:
- Delivery readiness should be as high as possible.
 - Procurement costs should be kept as low as possible.
 - Capital commitment and warehouse operations: To keep the capital commitment as low as possible, stocks should be reduced to a minimum. In addition, the warehouse operations costs (cost of storage space, security, etc.) should be kept low.
- b Conflicts occur between the individual goals, so that not all goals can be achieved in equal measure. Examples of conflicts:
- Delivery readiness vs. capital commitment and warehouse operations: A high level of delivery readiness requires large inventories, which lead to high storage costs in the form of capital commitment and warehouse operations.
 - Procurement costs vs. capital commitment: In order to keep procurement costs low, large quantities of materials should be purchased (quantity discount). However, this leads to large inventories, raising costs in the form of a high capital commitment.
- c Because the individual goals cannot all be fully and simultaneously achieved, every enterprise needs to consider which goal should be given more weight.

2

The question of whether Migros should keep large stocks on hand at all times does not have a simple answer. The magic triangle states that stocks should be kept small due to the capital commitment. This also makes sense, given the wide range of products that Migros offers, because some of the goods (especially in the area of foods) are highly perishable and may no longer be sold after the sell-by date. Unsold goods bring Migros no revenue for the expenditure that has already taken place. This argument would seem to favor the keeping of smaller stocks. On the other hand, it should be noted that Migros also strives to remain at a level of a high delivery readiness, so that customers are not faced with empty shelves. Missed purchases due to a too low delivery readiness also lead to costs for the retailer. This objection speaks for larger inventories.

There is therefore no one blanket answer to the question of whether Migros should keep large stocks on hand.

3

Warehousing costs	Examples
Warehouse operations	Rent expenses, energy costs, insurance of the stored goods, maintenance and repair, cost of inventory risk (e.g., theft, fire, etc.)
Capital commitment	Loss of interest from alternative investment opportunities (opportunity costs)

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a www.freitag.ch

b

Raw materials: (used)

- Bicycle tires
- Truck tarpaulins
- Seat belts
- Airbags

Supplementary materials:

- Thread

Supplies:

- Water
- Power (renewable)

Subassemblies:

- Imprint (Friday)
- Adjustable buckle

Accessories:

- Instructions for each product (booklet)
- Packaging, with description of the product

c

Procurement process:

- Determining materials requirements/procurement requirements for production: Since the product is very specific and there had never been a market for it, determining materials and procurement requirements will have been quite difficult, especially in the startup phase.
- Supplier selection: This step could also be difficult, given the type of material. In contrast to normal consumer goods, there would be no variety of suppliers from which to choose; instead, enterprises would have to be asked in order to come up with suppliers.
- Inconsistencies in the procurement, no constant supply possible.

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Advantages

- No capital commitment
- No storage or warehousing costs
- No loss of value through warehousing
- Reduction of lead times

Disadvantages

- Dependence on suppliers and traffic conditions
- Production stops with any delivery delays (no buffer times)
- Increased volume of traffic
- Increased information and coordination efforts

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a

Stock item	Quantity (units)	Cost price per unit (CHF)	absolute value (CHF)	relative value (%)
1	55,000	12.00	660,000	27.5
2	30,000	9.80	294,000	12.2
3	20,000	40.00	800,000	33.3
4	4,360	77.00	335,720	14
5	150,000	0.50	75,000	3.1
6	200,000	0.30	60,000	2.5
7	9,300	19.00	176,700	7.4
Total	468,660		2,401,420	100.0

b

Category	Warehouse item
A goods	1, 3, 4
B goods	2, 7
C goods	5, 6

- c It would be worth pursuing cost optimization with the A goods. These items have a high value and lead to correspondingly high storage costs in the form of high capital commitment. In this case, measures to optimize costs for Articles 1, 3 and 4 can be justified. These stock items possess a 74.8 percent relative share of the total value of the inventory.

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Category	Good	Reason
X goods	Energy-saving lightbulbs Detergent Printer cartridges	Consumption is relatively stable and subject to only minor fluctuations. The forecasting accuracy is therefore quite high. Little or no stocks of such goods need to be kept on hand because of the constant consumption.
Y goods	Ski tickets Sunscreen Heating oil	Consumption is somewhat variable. The fluctuations frequently result from the seasonal nature of demand for these goods. The forecasting accuracy is therefore limited, which means some limited stocks should be kept on hand.
Z goods	Spare parts for coffee machines	Consumption is subject to great fluctuations. The forecasting accuracy is correspondingly low. Such products should, in the case of inflexible suppliers, be kept in stock.

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a

- **Holding:** milk stored in large tanks for further processing, vegetables, such as potatoes, which can be stored for a longer time.
- **Safeguarding:** spare parts for a mechanic, raw materials for Freitag bags.
- **Speculation:** crude oil, which tends to always increase in price.
- **Finishing or revision:** wine, which gains value only through being stored.
- **Assortment:** display of garden furniture in spring.

b

- Milk production and vegetables are natural and seasonal goods. Storage allows for bridging the period between harvests (milking) and consumption.
- Mechanics, like other service providers, must be prepared for eventualities. Through the storage of spare parts, the mechanic can respond more flexibly to customer needs and significantly increased the amount of work that can be done.
- The price of crude oil tends to rise steadily, and it will probably continue to do so; buying and storing this commodity today can lead to big savings over time, depending on storage costs.
- Wine is an asset that only increases in value through being stored, so the storage time is essential both for the taste and for the selling price.
- Each spring, at the beginning of the season, the retailer will display its garden furniture. Displaying these items not only has marketing-related benefits but can simultaneously be considered as warehousing.

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- a Average stock = $(540 + 580) / 2 = 560$
- b Stock turnover = $2000 / 560 = 3.57$
- c Average storage period = $360 \text{ (days)} / 3.57 = 100.84 \text{ (days)}$
- d Stock would no longer need be to be held, which would give the three indicators (average stock, stock turnover, average storage period) a value of zero.