

# MSX30 INDEX GUIDE

APRIL 2021



<b>Contents</b>	
<b>Subject</b>	<b>Page No.</b>
<b>Introduction</b>	<b>1</b>
<b>What is an Index?</b>	<b>2</b>
<b>Price-Weighted Index</b>	<b>5</b>
<b>Value-Weighted Index</b>	<b>7</b>
<b>Un-Weighted Index (Equally-Weighted Index)</b>	<b>10</b>
<b>Total Return Index</b>	<b>13</b>
<b>Development phases of MSX30</b>	<b>14</b>
<b>Muscat Stock Exchange Index [ MSX30]</b>	<b>15</b>
<b>Weighted Method of MSX30</b>	<b>16</b>
<b>Selection criteria of MSX30</b>	<b>22</b>
<b>Review and Maintenance of MSX30</b>	<b>23-26</b>
<b>References</b>	<b>27</b>

## Purpose of the guide

- (a) To clarify what is an index;
- (b) To illustrate how the indices are computed;
- (c) To portray the MSX30 features and characteristics
- (d) To make it easier for users to replicate the indices in order to prop up their Investment and trading activities; and
- (e) To aid users in understanding the component factors which influence the performance of MSX indices.

## Introduction

The main goal of investing in securities is to achieve the best return on capital. When an investor buys shares of any particular company, his intention is either to hold the shares for the long term to receive dividends or to resell the shares in the near future for capital gain. Whether the investor is a speculator or a long-term investor, he/she needs to monitor and judge the performance of the company for taking appropriate decisions timely.

Securities market indices are used widely in different ways. They are designed to answer the fundamental question: “How did the market do today, yesterday or over any other chosen period of time?” Indices are also used by investors as a benchmark to judge the performance of individual portfolio. They facilitate conducting comparison in providing a systematic basis for evaluating, monitoring and comparing the performance of individual securities as well as managed portfolios. In addition, Indices are important to compute the systematic risk for individual security [Systematic risk is the relationship between the rates of return for a risky asset and the rates of return for a market portfolio of risky assets (Reilly and Brown, 1997:152-153)]. Securities market indices are also used to compare the performance of the financial markets as well as the whole economy of a particular country with other countries. Due to the importance of securities market indices, Muscat Stock Exchange has published this guide to provide essential information about MSX30 Index and the other three sectorial indices (Banks & Investment Index, Industry Index and Services & Insurance Index). It guides the investors to understand the computation methodology of the Index. In addition, it provides clear selection criteria of the index sample and it states the

review and maintenance rules. Muscat Bourse, by publishing this document, aims to increase the investor's awareness and to achieve a higher level of transparency in market.

## What is an Index?

An index is a number that expresses the relative change in a variable e.g. price, quantity or value from one period to another. A Securities market index is a statistical indicator, benchmark or a measure of movement in the general level and direction of prices of financial instruments or securities such as stocks, bonds, money market instruments, commodities, convertible securities, currencies, Guaranteed Investment Contracts (GICs), mutual funds and real estate (Shilling, 1996:1).

Indices vary in the number of shares included, the method of calculation and the weights assigned to each of the stocks. As a result, the relationship between an index and the movement of individual stock in the market need to be understood by the investors.

There are indices that include all the shares listed in the market like New York Stock Exchange (NYSE) Composite Index. However, there are indices that are composed of a sample of stocks such as Dow Jones Industrial average (DJIA) that include only 30 blue-chip companies and FTSE 100 which use 100 companies listed in London Stock Exchange.

The indices are also different in the method of calculation. They can be calculated as simple average of price relatives or a simple aggregate index.

### First: Simple Average Index

A simple average is calculated by adding stock prices and then dividing by a number (a divisor) to give the average price. The most famous examples of this method of calculation are DJIA and Nikkei-Dow Jones Average. The following formula used to calculate the simple average of price relatives:

$$\text{Index } t = \frac{\sum_{i=1}^n P_{it}}{N}$$

Where:

Index t = Index value on day t

P<sub>it</sub> = closing price for company i on day t

N = Number of companies in the index or a divisor

### Second: Simple Aggregate Index

In contrast, a simple aggregate index is a statistical weighting of stock prices compared to stock prices on a base year. Examples are Standard & Poor's 500 Composite Index and NYSE Composite Index (Faerber, 2000: 82-83). The following formula used to calculate the simple aggregate index:

$$Index\ t = \frac{\sum_{i=1}^n P_{it}}{\sum_{i=1}^n P_{ib}} \times \text{Base day's index level}$$

Where:

Index t = Index value on day t

P<sub>it</sub> = closing price for company i on day t

P<sub>ib</sub> = closing price for company i on base day

Base Value = 100, 1000... etc

Most financial markets in the world use one or more of the three types of indices:

Market value-weighted Index - Each stock is given a weighting proportional to its market capitalization.

price Weighted Index - Each stock is given a weighting proportional to its market price

Equal Weighted Index - Each stock is equally weighted in the index

Most popular stock market indices in the world are using market value-weighted index.

Table 1 shows some examples of the most famous indices, their types and number of companies included.

**Table (1): Examples of Stock Market Indices**

Name of Index	Weighting	Number of companies
Dow Jones Industrial Average (DJIA)	Price	30
Nikkei-Dow Jones Average	Price	225
S&P 500	Market value	500
NYSE composite	Market value	2,559
Russell 3000	Market value	3,000
FTSE 100	Market value	100
NASDAQ	Market value	4,879
Morgan Stanley consumer (CMR) Index	Equal ( Un-weighted)	30
S&P EWI	Equal ( Un-weighted)	500

### Price-weighted Index

Price-Weighted Index is a stock index in which each stock influences the index in proportion to its price per share. The value of the index is generated by adding the prices of each of the stocks in the index and divided over the closing on base day. Stocks with a higher price will be given more weight and, therefore, will have a greater influence over the performance of the index.



The formula used in calculating price-weighted index is:

$$\text{Index } t = \frac{\sum_{i=1}^n P_{it}}{\sum_{i=1}^n P_{ib}} \times \text{Base day's index level}$$

Where:

Index t = Index value on day t

P<sub>it</sub> = closing price for company i on day t

P<sub>ib</sub> = closing price for company i on base day

Beginning Index Value = 100, 1000, etc.

Example:

Day 1 (Base day)

Stock	Closing Price RO.
A	1
B	2
C	4
Total Amount	7
Index Level	(7/7)*100=100

## Day 2

Stock	Case A (Price in RO)	Case B (Price in RO)
A	1.5	1
B	2	2
C	4	6
Total Amount	7.5	9
Index Level ( points)	$(7.5/7)*100=107.14$	$(9/7)*100=128.57$
% change	7.14%	28.57%

In case A, the price of company A increased by 50% while the index increased by only 7.14% assuming no change in company B and C prices. In case B, the price of company C increased by 50% and the index increased by 28.57% assuming no change in company A and B prices. Both stocks increased by the same percentage but their effects were different in the index. We can conclude that high-priced stocks have stronger effects in price-weighted index than the low-priced stocks.

Price-weighted index is criticized in that when companies has stock split, their prices will decline and therefore their weight in the index will be reduced even though they may be large and important. This make the index biased because usually high growth stocks tend to split. Also, the price-weighted index does not consider that the price of the stock is not always the best indicator of the company size and effect in the economy.

## Value-Weighted Index

Is a stock market index weighted by the market capitalization of each stock in the index. In such a weighting method, larger companies account for a greater portion of the index. Most indices are constructed in this manner, with the best example being the S&P 500.

The formula used to calculate Value-Weighted Index is:

$$\text{Index } t = \frac{\sum_{i=1}^n P_{it} Q_{it}}{\sum_{i=1}^n P_{ib} Q_{ib}} \times \text{Base day's index level}$$

Where:

Index t = Index value on day t

P<sub>it</sub> = closing price for company i on day t

Q<sub>it</sub> = number of outstanding shares of company i on day t

P<sub>ib</sub> = closing price for company i on the base date

Q<sub>ib</sub> = number of outstanding shares of company i on the base date

Beginning Index Value = 100, 1000, etc

Example:

To make our computation simple, we need to keep the number of constituent stocks small. Let us assume that the index is composed of only three stocks: A, B and C.

### Day 1 (Base day)

Stock	Share Outstanding (1)	Closing Price RO. (2)	Market Value(1)* (2)
A	10	1	10
B	15	2	30
C	5	4	20
Aggregate Market Value (AMV)			60
Index Level ( points)			$(60/60)*1000=1000$

The aggregate market value (AMV) of all constituent stocks is the sum of the market value of each stock. The AMV of day 1 is RO 60. Day 1 will be taken as the base day on which the index is set at 1000.

### Day 2 (Case A):

Assuming the only change is in the price of stock B has increased the market value of this stock by 20%.

Stock	Share Outstanding (1)	Closing Price RO. (2)	Market Value(1)* (2)
A	10	1	10
B	15	2.4	36
C	5	4	20
Aggregate Market Value (AMV)			66
Index Level ( points)			$(66/60)*1000=1100$
% change			10%

### Day 2 (Case B):

Assuming the only change is in the price of stock C has increased the market value of this stock by 20%.

Stock	Share Outstanding (1)	Closing Price RO. (2)	Market Value(1)* (2)
A	10	1	10
B	15	2	30
C	5	4.8	24
Aggregate Market Value (AMV)			64
Index Level ( points)			$(64/60)*1000=1066.6$
% change			6.66%

As the previous example shows, the importance of individual stocks in the sample of the value-weighted index depends on the market value of the stock. 20% increase in the share price of stock B (highest market value company) caused a 10% increase in the index while 20% increase in the share price of stock C (highest priced stock) caused only 6.66% increase in the index.

### Un-weighted Index (Equally-Weighted Index)

The third type of indices is the Un-weighted index (equally weighted index). This index solved the problem of the price weighted index in which high-priced companies carry more weight than low-priced stocks. In equally weighted index, all stocks carry the same weight regardless of their prices or their market value.

This index based on the arithmetic average of the percent price changes for the stocks in the index. In this index, there is a fixed amount that will be invested in each company of the index sample regardless of the prices and market values of these companies. Each percentage change has equal weight.

In other words, if the price of company A increased by 10% and the price of company B decreased by the same percent, the index value will not change assuming that the prices of all other companies did not change. The following examples explain the calculation of this index.

### Example:

To build un-weighted price index, we need to invest a fixed amount in all companies. Assuming this amount to be RO 100, we will get the number of shares that should be invested in each company by dividing this amount by the share price in the base year as in the following table:

### Base Day

Stock	No. of shares to be invested in each stock	Closing Price RO	Market Value
	(1)	(2)	(1)* (2)
A	100	1	100
B	50	2	100
C	25	4	100
Aggregate Market Value (AMV)			300
Index Level ( points)			$(300/300)*100=100$

### Day 1

The following table shows the calculation of the index in Day 1. Note that the price of company A increased by 10% from base year, while the price of company C decreased by 10%. The price of company B did not change.

Stock	No. of shares to be invested in each stock	Closing Price RO	Market Value
	(1)	(2)	(1)* (2)
A	100	1.1	110
B	50	2	100
C	25	3.6	90
Aggregate Market Value (AMV)			300
Index Level ( points)			$(300/300)*100=100$

As can be seen from the above table, the index value in Day 1 did not change from its previous day level. This means that the 10% increase in company A offsets the 10% decrease in company C despite the price difference between the two companies.

The equal weighting method is more appropriate for showing the movement in the prices in the typical or average stock. If there are some differences between the companies in terms of size and industries, this way of weighting may not be the best way to construct the index.

## Total Returns Index

The previous types of indices do not consider return from payments of dividends. They reflect only the capital gain that investors would get from the movement of the stock prices. The index that reflects the returns from capital gain as well as dividend payments is called a Total Returns Index. Data on total returns indices are essential for accurate market analysis and for demonstrating the importance of long-term investing. Total returns indices can better illustrate the performance of investors over time and educate them on new investment opportunities. The total returns index is an appropriate benchmark for investors who are earning dividends and investing in income stocks.

The total return index is calculated by adding the return from the dividend payments to the existing index either it is value-weighted, price-weighted or equally-weighted index. The total returns index (TR) formula is as follows (“Total Returns Index – Methodology”, 2003):

$$\begin{aligned} \text{TR Index } t = & [\text{TR index } t-1 + (\text{TR index } t-1 \times \text{index return})] \\ & + [\text{Indexed dividends} + (\text{indexed dividends} \times \text{index return})] \end{aligned}$$

### Where:

TR Index t = Total returns index in day t

TR Index t = Total returns index in day t

TR index t-1 = Total returns index in day t-1

Index return = (current index – previous index)/ previous index

Indexed dividends = (Dividend payout in RO/ Index base capitalization on ex-dividend date in RO) X 10



## Development phases in MSX30 index

- **1992:**

Muscat Stock Exchange Index (Previously Muscat Securities Market and the name is been changed in reference to the Royal Decree: 05/2021) was launched, and June 1990 was set as a base date for the calculation of the index.

- **1/2004:**

The base value of the index changed from 100 points to 1000 in order to facilitate the comparison with other GCC and international securities markets as most markets use the 1000 as the starting index value.

- **7/2004:**

The index named MSX30 and each of the three-known sectors contributed 10 companies to the index.

The MSX30 guide was issued to help answering questions like the calculation methodology, selection criteria and so on.

- **4/2006:**

Muscat Stock Exchange applied the ground rule of 20% capping factor as a maximum weight allowed for any single company in the index. Consequently, the effect of any single company in the index will not exceed 20% irrespective of its market capitalization.

- **7/2009:**

MSX30 Index changed to free float market capitalization index and the 20% capping reduced to 10%.

## Muscat Stock Exchange **Index MSX30:**

On 1 July 2009, MSX30 Index changed to free float market capitalization index.

In calculating MSX30 Free Float Index, the following are taken into account:

- Freely available shares for trading are included only. Any shares fall under the following will be excluded:
  - Founders (exclusion ends when the company issues two balance sheets for two consecutive financial years).
  - Government holdings.
  - Strategic holdings (10% or more).
  - Locked-in shares, which are not tradable for at least 3 months.
- A 10% capping (CAP) is set to ensure wider representation of smaller company's in the index.
- The free float and capping revised (re-set) on quarterly basis. The revision is carried end of (March, June, September and December). The Index sample amendment on the other hand takes place on beginning of July of each year. The sample is selected based on the applicable selection criteria (Market Capitalization, Liquidity, and Earning per share).

The foremost objectives of the MSX30 are to depict the prices tendency of the listed shares objectively and to be a benchmark for individual and institutional investor to gauge the sentiment of their investment path. Ideally, a change in the price of an index represents proportional change in the stocks included in the index.

To achieve these objectives, the MSX30 has the following features:

1. It is comprehensive and sensitive to the market performance taking into account the diversification of companies among different market sectors.
2. It is investable and the investors are able to replicate it.
3. The Index weighting method, computation methodology, companies' selection criteria and the base date are clearly defined.
4. It includes only common stocks of public joint stocks companies listed in the Regular and Parallel markets in Muscat Stock Exchange. Preferred stocks, bonds, Mutual funds and companies listed in the Third market are excluded from the index.

MSX30 cap weighting method:

MSX30 is a value weighted rather than price or equal weighted index. The MSX30 value weighted index consists of 30 most liquid companies in the whole market. The company's weight in the index is determined by its relative percentage of the aggregate free float market capitalization of the 30 companies. Moreover, the CAP factor will be applied for those companies whose contributions in the index exceed the limit of 10% as a maximum limit weight in the total index value.

$$\text{Index } t = \frac{\text{Sample Aggregate Market capitalization} * \text{Free Float Coefficient} * \text{Capping Factor}}{\text{Base Market Cap}} \times \text{Base index level}$$

Or,

$$\text{Index } t = \frac{\sum_{i=1}^{30} (\text{Pit} \text{ Qit} \text{ Fit} \text{ Cit})}{\text{Divisor adj}} \times 1000$$

Where:

Index t = Index value on day t

Pit = closing price for companies i on day t

Qit = number of outstanding shares of company i on day t

Divisor adj = Adjusted divisor on day t

Cit = Capping factor coefficient of the instrument on day t

Fit = Free Float Factor (percentage of tradable number of shares as per the full market capital)

So, the formula used for calculating MSX30 is clear-cut computed by dividing the aggregate free float market capitalization of all constituent companies by a divisor. Essentially builds up from two parts:

- **The aggregate free float market capitalization of the sample size of the index:**  
(Last closing price X number of listed shares X free float factor X capping factor)
- **The divisor:** The divisor is a factor that converts adjusted market capitalization of constituent companies to the index level. It is derived at the starting point of the index (Base date) by dividing the adjusted market capitalization by an arbitrary number or Multiplier as the figure (1000) to be an initial point for the index.

The subsequent steps are followed to compute the divisor in the base year:

**Step one:** calculate the market value of the companies that make up the index in the start date, equivalent to the sum of the closing price (average price) multiplied by the number of shares subscribed in the start date.

**Step Two:** Solving for the new divisor:

$$\text{New Divisor} = \text{previous divisor} * (\text{adjusted market cap}) / (\text{previous market cap})$$

**Or,** it can be alternatively computed subsequently: = previous divisor \* (

$$\text{Divisor} = \text{adjusted market cap} / \text{previous index level}$$

In other words, compute the market capitalization of the index before and after the change. Before the change we know the market cap, the index level and the divisor. After the change, we know the market cap (with the new stock instead of the old stock), we know the index level (which will not change) and we can solve for the new divisor.

The new divisor is simply the figure that maintains the index at the same level as before the change in the market cap.

MSX30 does the calculations after the market closes. The index opens the next day with the new stocks and the new divisor, but the index level only changes if the prices of the stocks change.

#### Example:

Let us assume that the index is composed of only three stocks: A, B and C.

Stock	Share Outstanding (1)	Closing Price RO. (2)	Market Value(1)* (2)
A	10	1	10
B	15	2.4	36
C	5	4	20
Aggregate Market Value (AMV)			66
Divisor			60
Index Level ( points)			$(66/60)*1000=1100$

If the shares of stock C replaced by D, the Divisor is adjusted so the index level doesn't change.

Stock	Share Outstanding (1)	Closing Price RO. (2)	Market Value(1)* (2)
A	10	1	10
B	15	2.4	36
D	12	3	36
Adjusted Market cap (AMC)			82
Adjusted Divisor			74.5454
Index Level(points)			$(82/74.5454)*1000=1100$

This way, an index can be adjusted when companies issue or buy back shares.

#### MSX30 cap weighting pricing scheme:

Muscat Stock Exchange indices are disseminated performing VWAP (volume-weighted average price) to set its closing prices for shares traded. VWAP represents what's really happening in the market because it takes into account not just minute-to-minute prices but also trading volume.

Basically, if you take all the transaction prices that occur in a single stock each day, and weight them by share volume, you will crop up with a constantly changing average price throughout the day. At the end of the day, you will be able to see the actual volume-weighted average price. The formula below demonstrates how (VWAP) is calculated:

$$\begin{array}{rcl}
 & 30 & \\
 & i & \Sigma (\text{trade volume}) (\text{trade price}) \\
 \text{VWAP} = & \frac{}{} & \\
 & i & \Sigma (\text{trade volume})
 \end{array}$$



## Eligibility Criteria

The selection of stocks for the index should be in such a manner that it represents the whole market. In addition, it will be guaranteed that the selected constituents have high percentage coverage of the market in terms of market value.

To be eligible for initial and continuing inclusion in MSX30 Index, a security must meet the following criteria which represent the companies' size, performance and liquidity.

1. Market capitalization of the companies (assigned weight 40%): The companies with high market capitalization in whole market will be considered for inclusion.
2. Liquidity of the stocks (assigned weight 45%): a stock's liquidity is very important to ensure that the index is investable. Therefore, only liquid companies are eligible for inclusion and measured by:



CRITERION	ASSIGNED WEIGHT
Share turnover	25%
Number of traded shares	25%
Value of traded shares	25%
Number of days	25%

3. Performance of the companies (assigned weight 15%): Well-performed companies in term of profitability will be considered for inclusion. A simple way to screen the companies' profitability is through its earning per share.
  - Muscat Stock Exchange has the right to include/exclude any company in/from the index sample to attain the stated objectives of the index








## MSX30 review and reconstitution.







The MSX30 is reviewed and reconstituted on annual bases to ensure that it continues to reflect the market sentiments and to monitor the index sample compliance with the stipulated requirements to be qualified for sustained inclusion in the index. The addition or deletion of an index component takes place only on this review. Imperative to be mentioned, the newly listed companies will only be considered for inclusion after a minimum period of six (6) months from the date of listing. (See appendix E).

The index maintenance takes place in the following cases:

Corporate Action Type	Outstanding Number of shares	Previous Closing Price	Formula	Adjustment Time	Company Status	Adjustment in the Index	Impact on Divisor	Examples
Cash Dividends	---	---	---	---	Open for Trading	---	---	A company with a capital of 1 million shares decided to distribute 5% cash dividends. In this case the Closing price remains constant.
Bonus Share			Closing Price ÷ (1+% increase in shares)	Day after AGM	Open for Trading	Adjust the stock price to keep the market capitalization of the company equal before and after the distribution	---	A company with a capital of 1 million shares decided to distribute 10% bonus share assuming the closing price was 3 RO. In this case, New capital = 1000000 × 1.1 = 1,100,000 Reference price = 3 ÷ 1.1 = 2.727 RO per share

Stock Split			Closing Price x Split Ratio	Day after AGM	Suspended from trading till finished shareholders record modification	Adjust the stock price to keep the market capitalization of the company equal before and after split	---	A company with a capital of 2 million share decided to split the stock by (1:10), assuming the closing price was 11 RO. New capital = $2000000 \times 10 = 20,000,000$ shares and the reference price = $11 \div 10 = 1.1$ RO
Reverse Split			closing price x reverse split ratio	Day after AGM	Suspended from trading till finished shareholders record modification	Adjust the stock price to keep the market capitalization of the company equal before and after reverse split	---	A company with a capital of 2 million shares decided to merge the stock by (10:1), assuming the closing price is 1.1 RO. New capital = $2000000 \times 0.1 = 200,000$ shares and the reference price = $1.1 \times 10 = 11$
Right Issue					Open for Trading	Adjust the base value (divisor) of the index to maintain		A company with a capital of 1.5 million shares decided to issue

			$\frac{(\text{closing price} \times \text{outstanding number of shares}) + (\text{number of rights issued} \times \text{subscription price})}{(\text{number of rights issued} + \text{outstanding number of share})}$	Cut-Off Date		the previous value of the index		500000 Shares through right issue of 1.200 Riyals per share assuming that the closing price was 2.5 Riyals which means that the number of shares after the right issue = 1.5 million + 0.5 millions = 2 million shares and the modified closing price = $((500000 \times 1.5) + (1500000 \times 2.5)) / 2000000 = 2.25$ Riyal, Price of the right = Closing price - modified closing price = $2.5 - 2.25 = 0.250$ RO.
IPO/ Private Placement		---	---	Listing Date	Open for Trading	Adjust the base value (Divisor) of the index to maintain the previous value of the index		A company with a capital of 2 million shares decided to increase its capital through private placement by issuing 500000 shares assuming that the closing price was 10 Riyals which means that the new number of shares = 2 million $\times$ 10 = 20 million shares, while closing price stay constant.
Capital Reduction			$\text{Closing Price} \div (1 - \% \text{ decrease in shares})$	After the expiration of objection period, which is sixty days according to the Commercial Companies Law of Oman No. 4 in 1974, as amended, Part Five: Joint Stock Companies Chapter Two (Shares of Stocks and Bonds) as Article 84	Open for Trading until the actual reduction procedures begin	Adjust the stock price to keep the market capitalization of the company equal before and after the distribution	---	A company with a capital of 1 million shares decided to reduce its capital by 10% to cover financial losses assuming that the closing price was 2.5 Riyals so the number of shares after the reduction = 1 million $\times$ (1 - 0.1) = 900000 shares, modified closing price = $2.5 \div (1 - 0.1) = 2.78$ Riyals
						Adjust the base value (Divisor) of		

Buy-Back share		---	---	---	Open for Trading	the index to maintain the previous value of the index		A company with capital of 5 million decides to buy back 1 million of its share direct from the market. So the closing price will not affect whereas the number of share will be= $5m - 1m = 4m$
Converting Bonds to Stocks or Merger & acquisition		---	---	After the expiration of objection period in the case of mergers is 3 months by the Commercial Companies Law of Oman No. 4 in 1974, as amended, Part One Chapter Two (2): Merger of Companies Article 13 (8)	Open for trading until the actual merging procedures begin	Adjust the base value (Divisor) of the index to maintain the previous value of the index		----
Company Addition or Deletion	---	---	---	Index Maintenance Date	Open for Trading	Deducted the market cap for the old sample and add that one for the new	 	In case of adding or removing companies from the index, those companies capital need to be added or removed from both the index and the base year value.

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