



Frequently Asked Questions

Application: VMS™ CubeMaster, LOGEN Solutions

1 What does the VMS mean?

VMS is the abbreviation of “Vanning Management System”. The word “Van” means an enclosed wagon or motor truck used for transportation of goods or animal, or transportation by van. Therefore the “Vanning” can get the means of all jobs for loading on a limited space. Likewise, VMS is a computerized sequential process management system on packing & loading. It is not only on a process computerization, but also, by approaching from the view of optimization, on a way to find out the optimal solution on the measures, quantities, receiving methods, and loading patterns of packing & loading object.

2 Why packing and loading problems are important in supply chain?

The packing and loading problems are defined “When container’s measurement is given, maximize the cube efficiency on filling the container with products and pallet considering the constraints in the real fields”. They are in the realm of OR (Operational Research) and classified as non-polynomial algorithm problem, “NP-Complete problem”. In order to get the feasible solution, we should solve it case by case on each problem and it needs academic solving phases with arithmetic calculation. These properties make many companies fail to computerize the solution of the problems.

In supply chain, the packing and loading problems are core and basic factors that always occur in supply chain such as receiving, putting-away, picking, packing, shipping and transportation. When products are shipped or transported, they cost up to 70% of total logistics cost in general. Therefore many companies want to optimize those problems and try to reduce the cost. The competitive priority of a company is depending on low cost and high efficiency in all of the supply chain. Therefore, these problems have to be solved to reduce overall cost in the supply chain.

3 What is the key strength and positions of CUBEMASTER?

CUBEMASTER has its core engine to optimize the loading and packing problems built on optimization and heuristics algorithm. It has also easy-to-use user interface let the user to define and solve those problems with simple and easy way. CUBEMASTER can be implemented quickly in the real fields and gives impact on bottom-line in short period.

- 1 High ROI on rapid implementation
- 2 Lower price but higher level quality than competitors
- 3 Experience of successful applications on major companies
- 4 Concise & powerful functions of optimizer engine with excellent performance
- 5 Diverse products line-up to diverse needs
- 6 Diverse & powerful functionality acquired on the real field
- 7 Intuitive and interactive user interface

Table 1 Key strength of CUBEMASTER

4 What are the target industries of CUBEMASTER?

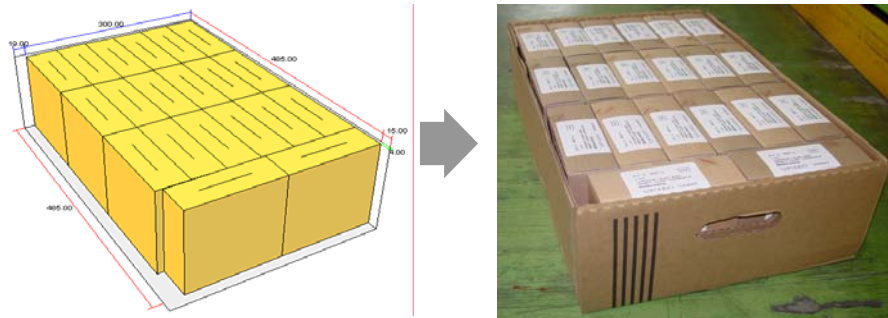
The target industries are manufacturing (automotive, electronics, pharmacy, cosmetics, food & beverage, house goods & healthcare), logistics (3PL-3rd Party Logistics, KD-Knock Down, aftermarket parts distributors, logistics forwarder, cargo service provider), educations (university/college, researcher), and military and government organizations. And with DevPack, the software vendors who make ERP an SCM could be the targets.

5 What are the problems that CUBEMASTER can solve on packing and loading?

CUBEMASTER solutions can be used in all the process in supply chains that are from the order receiving, order fulfillment, picking & packing, shipping and delivery process. The main problems domains that are solved with CUBEMASTER are as follows.

Packaging Standardization

Packaging standardization is the initial phase for the efficient logistics management. It standardizes the measurement of the pallet, box and products. This is more required when your packaging stages are more complex. For instance, when you pack the products into carton and then the carton into box and the boxes onto the pallet, your total cost of packaging may depend on the number of cartons and boxes. This means you should have standard dimension of the cartons and boxes that cover all the products. CUBEMASTER helps you develop the standard measurement on the carton, box and pallet.



Order Plan

On recent business, the accuracy on demand forecasting and its application on production scheduling are critical. Especially, the forecasting system for the explanation of the avail-to-promise quantity to the buyer is required. CUBEMASTER's simulation on Order Forecasting provides optimal lot-size on order that will be adaptively loaded on truck or container in execution process.

ATP Simulation

The information on actual material volume issued on the orders in the promised period will help efficient arrangement of equipments, human resources and job scheduling. CUBEMASTER's simulation on ATP quickly finds out the volume of pallets to hold products, based on ASN information.

Pallet/Carton Capacity Plan on Vendor Supply

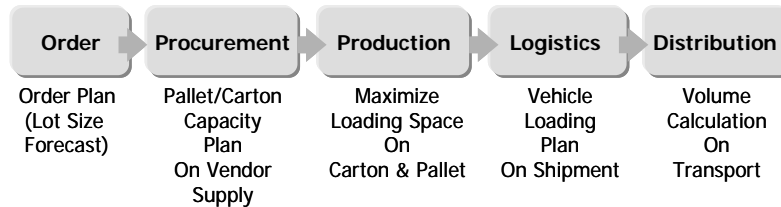
On procurement, calculating the box volume from the SKU(stock keeping unit) is required but it depends on constraints of each companies. It is more useful to electronics and automotive parts suppliers (CKD, SKD, 3PL).

Maximize Loading Space on Carton & Pallet

At this phase, calculation on pallet volume of to-be-produced production is possible in advance of shipping. As the result, the boxes and parts are allocated into each pallet and then picking and packing order can be issued.

Vehicle Loading Plan

After pallet simulation, simulation on stuffing the packed box and pallets onto truck or container will follow. In this phase, you can calculate the required volume of vehicles or container, and print out the loading order of each vehicle or containers' loading patterns.



6 What are the returns of CUBEMASTER?

CUBEMASTER is simulation solution that supports optimal result on packing and loading problem. Expected returns include "increasing of speed and flexibility, reducing cost of logistics". Competitive companies need fast workflow with high productivity on low cost, plus flexibility on changing. Therefore companies who adopted CUBEMASTER get the competitive position. These are expected benefits.

Reduction on direct logistics cost

- By increase cube efficiency, the direct cost on logistics can be reduced.

Improving productivity using optimal solutions

- Optimal solutions eliminate wasted space, and increase load efficiency.

Increased speed of logistics process

- Eliminating inefficiency by avoiding manual plan improves packing and loading process speedy.
- Prompt vehicle utility plan is possible.
- Fast process on great number of data and sales policy.

Achieving more flexibility on logistics processes

- Getting flexible on variety customer needs and market changes
- Improve reliability and less time consuming on reprogramming

Assuring managing state of logistics

- Absorb the changes at discretion into normal control

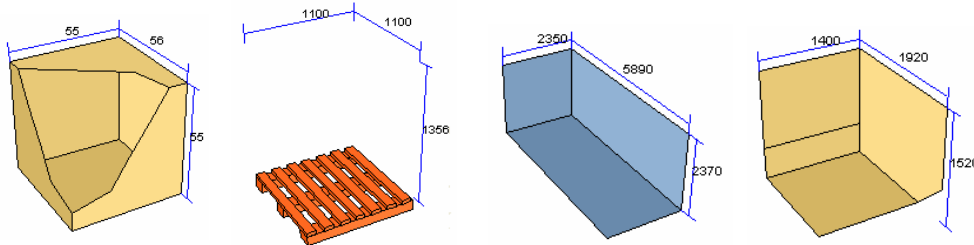
7 What is the ROI when I purchase CUBEMASTER?

The logistics cost reduction on implementing CUBEMASTER takes effect in a short period. This means that cost reduction is larger than investment cost. Generally, ROI on CUBEMASTER is 200% up to 600% in the first year. Below table is analysis on ROI.

Category	Reduced Costs	Remark
Reduced Packaging Materials	\$1,300 / Month	A Reduction of 400 CBM / Month
Reduced Containers & Delivery Costs	\$15,000 / Month	\$2,500 / Container
Reduced Man-Hours (MH)	\$10,650 / Month	A Reduction of 50% - from 3,600 MH to 1,620 MH
Reduced Claims or Reworks / LOT	\$8,500 / Month	A Reduction of 80% - from 4.0% to 0.8%
Reduced Total Costs	\$35,450 / Month	\$ 425,400/ Year
ROI (Return on Investment)	At Least 500 %	Initial Investment: \$150,000
Payback Period	Less Than 5 Month	Life of the Project: Over 2 Years

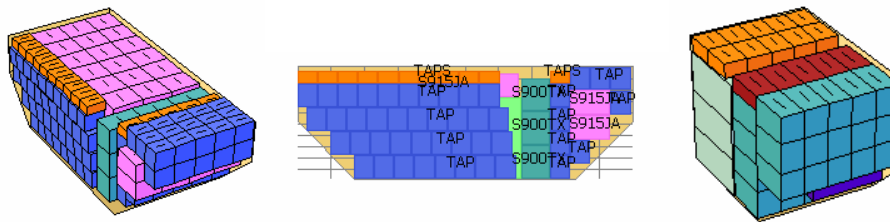
8 What kinds of containers does the CUBEMASTER support?

CUBEMASTER supports any kinds of hexahedron container such as box, pallet, vehicle, container, warehouse, etc. When a size of container get defined, even virtual space is possible to simulate. CUBEMASTER supports basic boxes, pallets, trucks and containers currently used in logistics field and airfreight container was added recently.



9 Is it possible to load on non-hexahedron containers as airfreight container?

Presently CUBEMASTER supports airfreight container among non-hexahedron containers only. The airfreight container is made to fit with the air flight body dislike the sea container.



10 Is it possible to load non-hexahedral products?

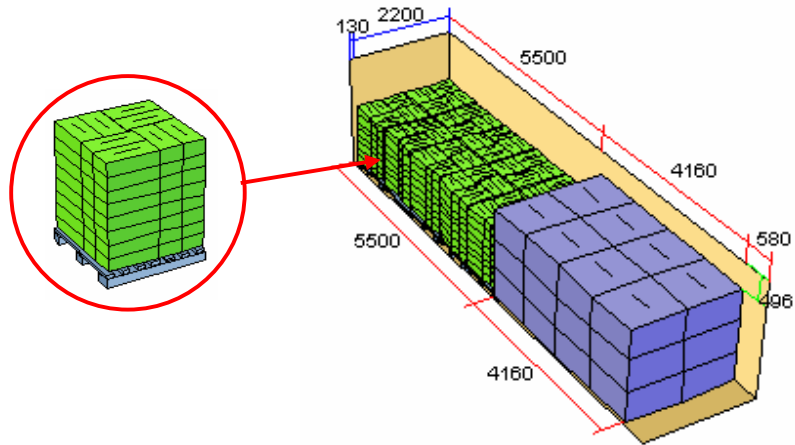
Currently the CUBEMASTER executes simulations with the sizes of hexahedrons such as fundamental data. To apply non-hexahedron products CUBEMASTER assumes those as hexahedrons. More researches are on the way to load non-hexahedron products like cylinders, bottles, etc.

11 Is it possible to solve the "SET loading Problem" such as load air conditioner sets or audio sets?

Of course it is possible. It can be solved with simulation type called "Set Loading". There are many cases of SET loading which are air conditioners or audio sets. They must be loaded with the main body and the accessories keeping the set ratio.

12 Is it possible to load boxes on pallets and then pallets on containers(2 phase loading simulation)?

Of course, it's possible. That is one of the basic functions in "CubeMaster". Following picture shows the 1st phase, products loaded on pallet and then loaded into container at the 2nd phase. In this phase, the pallet is treated as product.

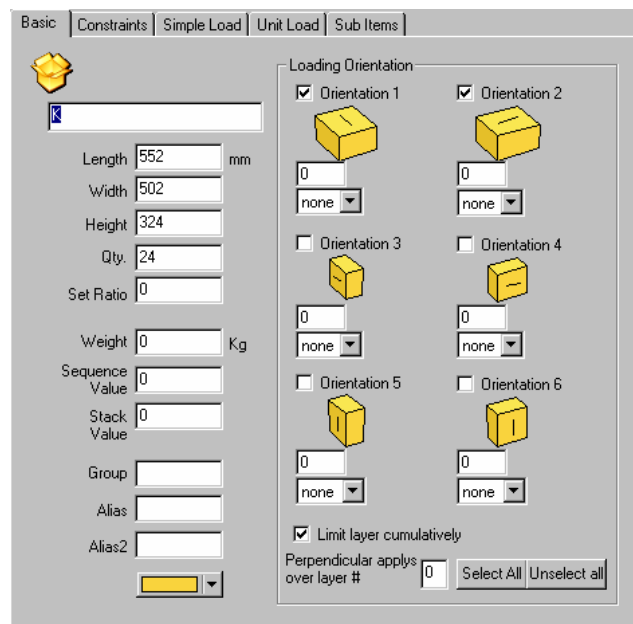


13 Can I limit the maximum number of product kinds in a container?

Sometimes the maximum number of product kinds needs to be limited to meet the constraint in real fields. These rules are entered at the "Advanced Property" of "Simulation Options".

14 Is it possible for the user to decide the loading orientation of products?

Products are assumed hexahedral on CUBEMASTER. Therefore, there are basically 6 orientations on each product. It is alike with cubic. Use can select which orientations are used in the load. Products will have default orientations if user does not select them. These rules are entered at the "SKU Property" of "SKU List" or "Simulation Explorer".



15 Is it possible to load heavy SKU at the bottom of container?

The weight consideration to load is important to adaptive simulation. These rules prevent the products from breaking when heavy products are stacked above others. Therefore it may be the best way that the heavy products stack on the bottom. CUBEMASTER supports stacking rule by entering the stacking values. To get loaded at the bottom, just set the values of each SKU.

16 There are corner castings at the upper side of container. Can you simulate load with the consideration of corner casting?

Corner casting is one that the user should consider when he/she loads on a sea container. The corner castings are at both front and rear topsides of container and loading at that space is not available in real fields. To avoid these, corner-casting space should be considered as unavailable spaces and these will prevent the products from being loaded at the space.

17 Can the sequences be considered when products are unloading (or loading)?

The unloading sequence should be considered when the using truck or container. CUBEMASTER supports the sequence in which products are loaded in container. Products with lower value get loaded at the inner side and the upper at door (outer) side.

18 Can I limit the maximum weight on container?

These rules are important to adaptive simulation considering constraints in real fields. Generally the weight of vehicles would be limited differently by the type of the load. CUBEMASTER supports those weight limitation. At the container information window, the maximum weights of vehicles or containers can be entered and these will let CUBEMASTER avoids overweight loadings.

19 Can I get the information of each wheel's weight and the weight distribution of the bottom?

On truck loading simulation, the information on the weight of the each wheel is useful. The weight on each wheel can be validated in the loading pattern property of CUBEMASTER. The weight distribution of bottom can be found on the "weight distribution chart".

20 Is it possible to adjust the loading pattern at discretion?

CUBEMASTER provides "Simulation Explorer" of the tree structure. By using the "Simulation Explorer", user can edit or adjust the loading pattern. Simulation explorer is similar to Windows Explorer. The loading patterns of container or truck (the outcome of simulation) can be adjusted at the "Simulation Explorer". The "Drag & Drop" function enables user to change the positions of products or to replace the product with the other products.

21 Is it possible the what-if analysis on utilization of the unused space?

CUBEMASTER provides the information on the "Unused Space". The spatial coordination and the volume of the "Unused Space" show in the property windows which includes the list of manually loadable product on that space. With those information, user can decide on the practical using of the "Unused Space" whether to load any products or not.

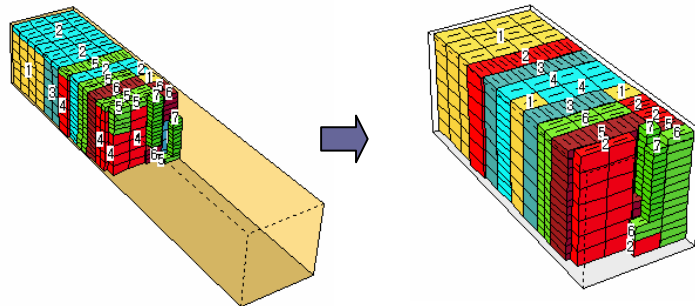
Details Properties Loadable Packages Log To Do										
Scan Loadables <input checked="" type="checkbox"/> Scan on selection <input type="checkbox"/> Show loadables only										
	Group	Name	# Current	# Loadable	# Required			Length	Width	Height
1	1	CF-20511KE	0	-1	-1	Full	Partial	562.00	742.00	572.00
2	1	CF-14510KE	0	-1	-1	Full	Partial	439.00	539.00	437.00
3	1	CDI-605	0	54	54	Full	Partial	318.00	248.00	385.00
4	1	CDI-905	0	54	54	Full	Partial	318.00	248.00	385.00
5	CDI-95	<<Missing in master data>>	0	0	0	Full	Partial	0.00	0.00	0.00
6	LS-L1264AL	outdoor	0	8	8	Full	Partial	360.00	920.00	585.00
7	LS-L1264AL	indoor	0	18	18	Full	Partial	371.00	962.00	246.00
8	LS-L1264AL	kit 6.35/12.7mm/5m	0	-1	-1	Full	Partial	575.00	575.00	105.00
9	LP-E5082CL	outdoor	0	-1	-1	Full	Partial	495.00	1070.00	1300.00
10	LP-E5082CL	indoor	0	-1	-1	Full	Partial	536.00	688.00	1900.00
11	LP-E5082CL	kit 9.52/19.05mm/15m	0	-1	-1	Full	Partial	820.00	720.00	215.00
12	LP-E5082CL	BASE panel	0	-1	-1	Full	Partial	700.00	800.00	80.00
13	1	GR-3495QF	0	-1	-1	Full	Partial	626.00	595.00	1710.00
14	1	GR-3895QF	0	-1	-1	Full	Partial	626.00	595.00	1880.00
15	1	GR-L267DBQ	0	-1	-1	Full	Partial	918.00	960.00	1780.00

22 Is it possible to filter the unused space after simulation?

CUBEMASTER shows the empty space as "Unused Space" with 3D graphics. Those "Unused Space" results from the shortage or the inappropriate size of product. The "Unused Space List" clearly displays the empty spaces. Also, by setting the condition on "Unused Space", corresponding "Unused Space" can be showed. And "Display Detail" enables user to confirm the list of the loadable product at the "Unused Spaces".

23 Generally, when the products volume is smaller then the 40FT container's one, they should be loaded on 20FT container. Is it possible to simulate to this rule?

Of course it's possible. When the cube efficiency is bellow 50%, you would nit use 40FT container. In this case, user can change container by selecting other container type at the "Simulation Explorer", or by right mouse clicking on "Result of loading" and "Change Other Container". And then container will change from



40FT to 20FT.

24 Is it possible that the result of simulation can be exported to Microsoft Excel?

CUBEMASTER provides the "Export with other format". This will the result of simulation exported to other application types such as MS-Excel, Word and Powerpoint.

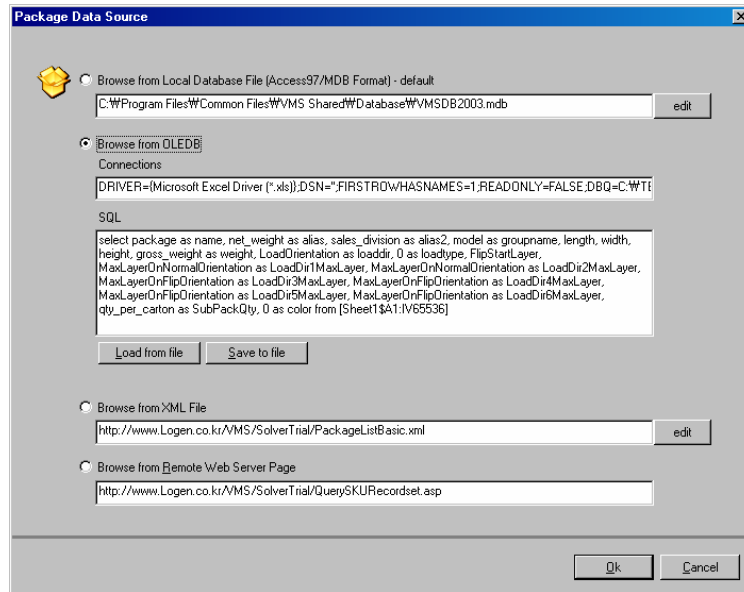
25 What is the way of sharing the 3D loading pattern of the simulation result with customers or overseas' branches?

CUBEMASTER provides the "Communication (Data Share) mode" which enables users or others to share

the simulation result. This mode includes publishing to web server and exchanging via P2P protocols. For more information, please visit http://www.logensolutions.com/VMS/Services/asp_body.htm.

26 Can CUBEMASTER be integrated with external database or applications?

CUBEMASTER can access the external database in several ways. First, it uses the OLEDB technology to access the well-known database types like MS-Excel, DBASE and CSV, and RDBMS like MS-SQL Server and ORACLE. You can see the example screen that access the MS-Excel file by using OLEDB at below.



CUBEMASTER has the DevPack - software development components for the customization and integration with larger system such as ERP, SCM and WMS. This means that CUBEMASTER could be integrated seamlessly with external database existing in legacy system very quickly and efficiently.

27 Is it possible that CUBEMASTER integrated with the legacy systems like WMS or ERP? What is the data format needed to link CUBEMASTER?

To link loading simulation in CUBEMASTER, basically the information of the product and containers are required. On product, the length, width and height are necessary and the weight, the loading orientation and stacking value are optional. In same manner, the necessary one of the container is the length, width and height. In addition, the detail information on products and containers makes the simulation more precise and accurate.

Getting integration CUBEMASTER is simple. The simplest way is to use a function called 'Importing the external data' in the CUBEMASTER. That function provides the way to import the external data in diverse format such as xml and ASCII. The seamless way is to use the software development components - DevPack. DevPack, a member of CUBEMASTER products suite, is ActiveX components can be embedded in the other applications. DevPack is implemented and featured on Microsoft Windows DNA and .NET technology. For more information, please visit <http://www.logensolutions.com/VMS/DevPack/DevPack.htm>.

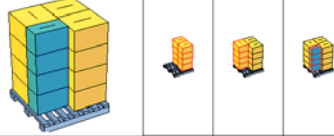
28 Is the report on the simulation with job order form provided?

After the completion of simulation, the optimized loading pattern of the simulation result displays practical

job order. CUBEMASTER basically provides the report of "Summery Report", "Container List", "Loading Guide" and "Picking List". Also, images of loading patterns can be copied and appended to report at the discretion of user.

Alias	Alias2	Name	Qty	
7.78	M/T	CDI-90S	500	#1 40ft
21.2	CTV	CF-20S11KE	50	#1 40ft
77	REF	GR-389SQF	5	#1 40ft
9.7	CTV	CF-14S10KE	25	#1 40ft
69	REF	GR-349SQF	3	#1 40ft
78	REF	GTF312G	10	#1 40ft
63	REF	GR-5392QVC	10	#1 40ft
65	W/M	WD-80130F	10	#1 40ft
159	REF	GR-L26706Q	1	#1 40ft
6.72	M/T	CDI-60S	1	#1 40ft
32	RAC	outdoor	25	#2 40ft
93	RAC	outdoor	5	#2 40ft
9.5	RAC	indoor	25	#2 40ft
66	RAC	indoor	5	#2 40ft
3	RAC	kit 6.35/12.7mm/5m	25	#2 40ft
6	RAC	kit 9.52/19.05mm/15m	5	#2 40ft
5	RAC	BASE panel	5	#2 40ft

SEQ	Package	Qty	Length	Width	Height	Unit CBM	Total CBM	Weight	Total Weight
1	K	12	552.00	502.00	324.00	0.09	1.08	0.00	0.00
2	KW	4	502.00	276.00	324.00	0.04	0.18	0.00	0.00
Total		16					1.26		0.00



SEQ	Package	Qty	Length	Width	Height	Unit CBM	Total CBM	Weight	Total Weight
1	K	12	552.00	502.00	324.00	0.09	1.08	0.00	0.00
2	KW	4	502.00	276.00	324.00	0.04	0.18	0.00	0.00
Total		16					1.26		0.00