Quick Pallet Maker

Instructions Manual

How to register Quick Pallet Maker

In order to use the entire file handling functions within QPM, which are saving, exporting, copying and printing (without the DEMO message), you must register the application. This involves making a payment in function of the amount of computers on which you use the application. The procedure is the following:
• Visit the web page and follow the instructions to make your payment.
• Open Quick Pallet Maker and select "Register" from the Help menu (Windows OS) or from the Apple menu (Mac OS). A window like the one at left will appear.
• Type in (or preferably copy) the registration name and serial number as specified in the confirmation email that was sent to you. Any change in the spacing will alter the results and will not unlock the hidden features.
• Quit Quick Pallet Maker and restart the application.
• To check if the registration process was completed, open the "About QPM" window through the appropriate menu item that is located under the Help menu (Windows) or under the Apple menu (Mac OS). It should contain your registration name and serial number.

After this process has been completed, the open, save and export menus (where applicable) should not be gray anymore.
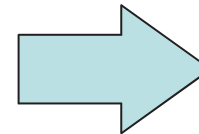
How Quick Pallet Maker works

Quick Pallet Maker is essentially a calculating application. In other words, the user will enter some data at one stage and issue a calculating command to obtain a set of results that are tailored to the input data. The intermediate results can then be handled to provide the user with modified results from which he/she will calculate the final solution. There are four main windows in Quick Pallet Maker; the Input Window, the Results Window, the Container Fill window and the Report Window. The user can move through these windows as in the graphics at right.

When the program starts, the user can choose from two types of input windows (using the File menu): start from Primary Package dimensions or start from Box Dimensions. The basic data is entered in these windows and in the case partitions (dividers) window if the user is starting from Primary Package dimensions. The Advanced Input Options window can be used to vary one of the input parameters (starting from Primary Package) and you can either obtain a table of solutions or just the optimal solution. The Results Window is accessible directly through the Input Window, or through the Advanced Input Window. From the Results Window (a. k. a. "Available Solutions"), the user can calculate case compression or sort the data. The container fill window can also be accesed from the Results Window. The Detailed Report is generated only from the Results Window and presents 4 different ways for presenting the data.
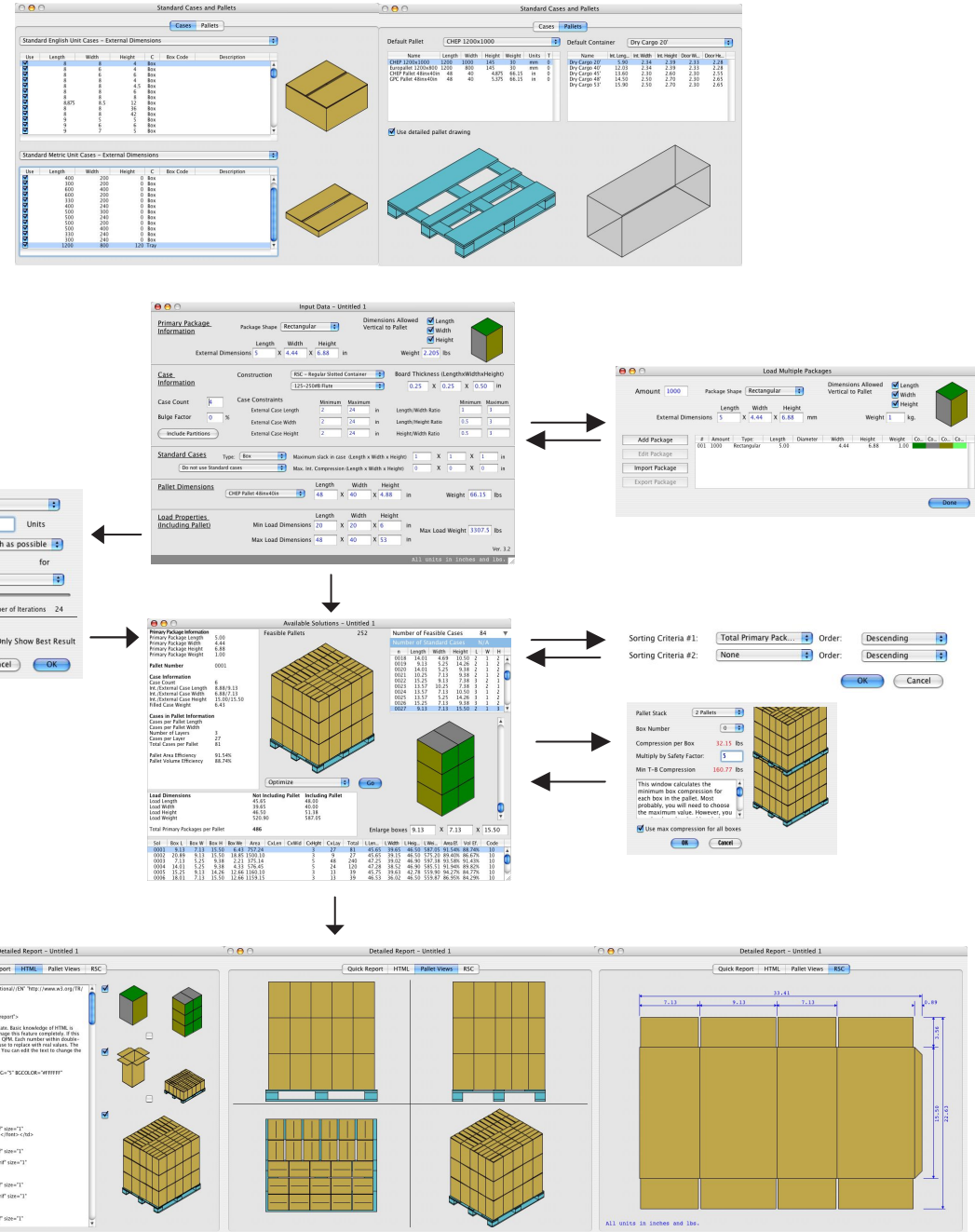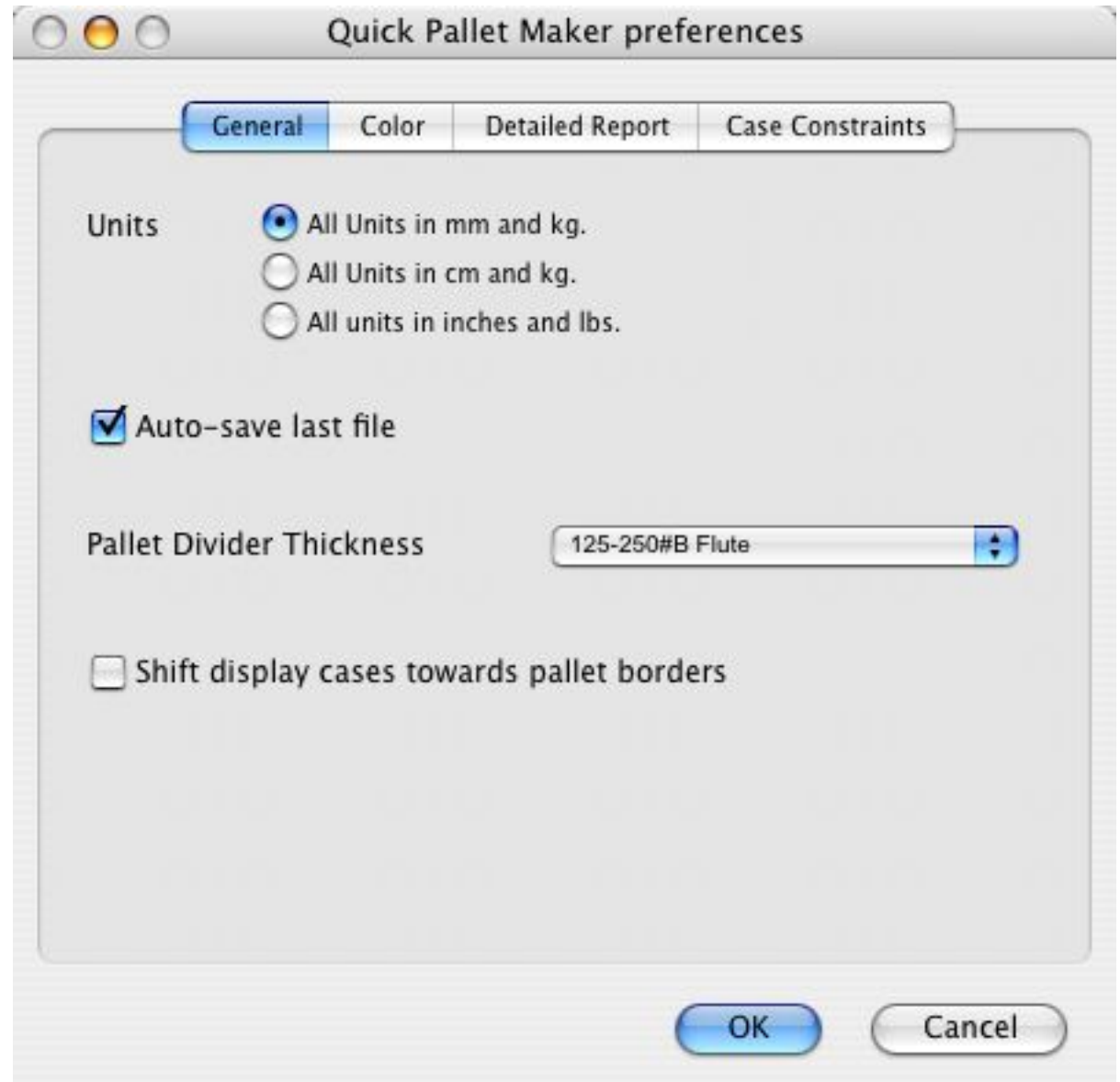
Setting the User Preferences - General tab

Units: The default units are selected so the user will not need to change them every time he/she runs the program.

Auto-save: Selects whether the user will open each new document with the last input data that he/she used or with the default input data. This feature is intended for those people that work with data that presents little variation, thus saving time.

Pallet Divider Thickness: This pull-down menu defines the board type that will be used when displaying and calculating pallet dividers or slipsheets.

Shift display cases: This option allows the user to move the cases towards the pallet borders when creating display (pinwheel) pallets.
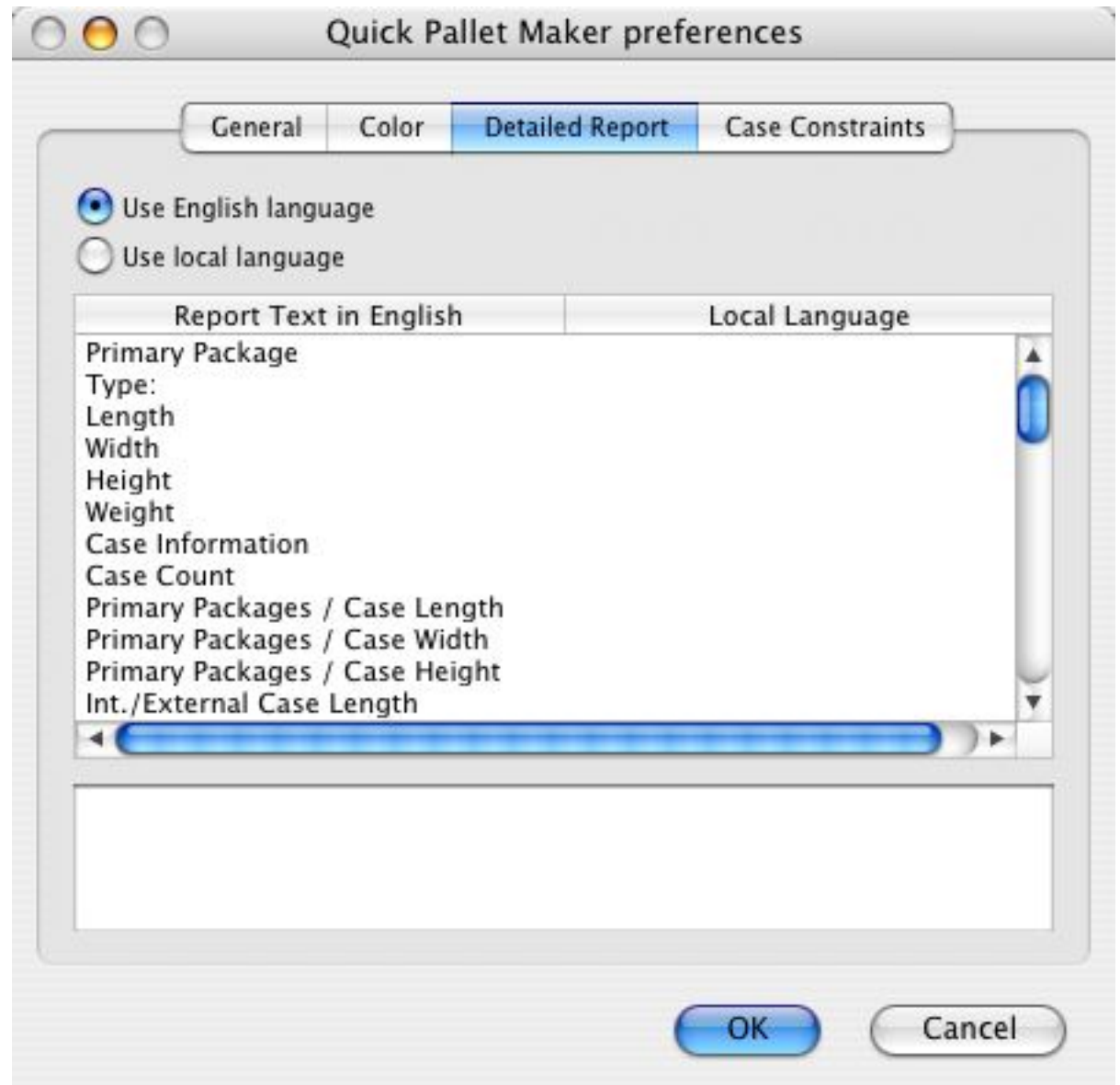
Setting the User Preferences - Color tab
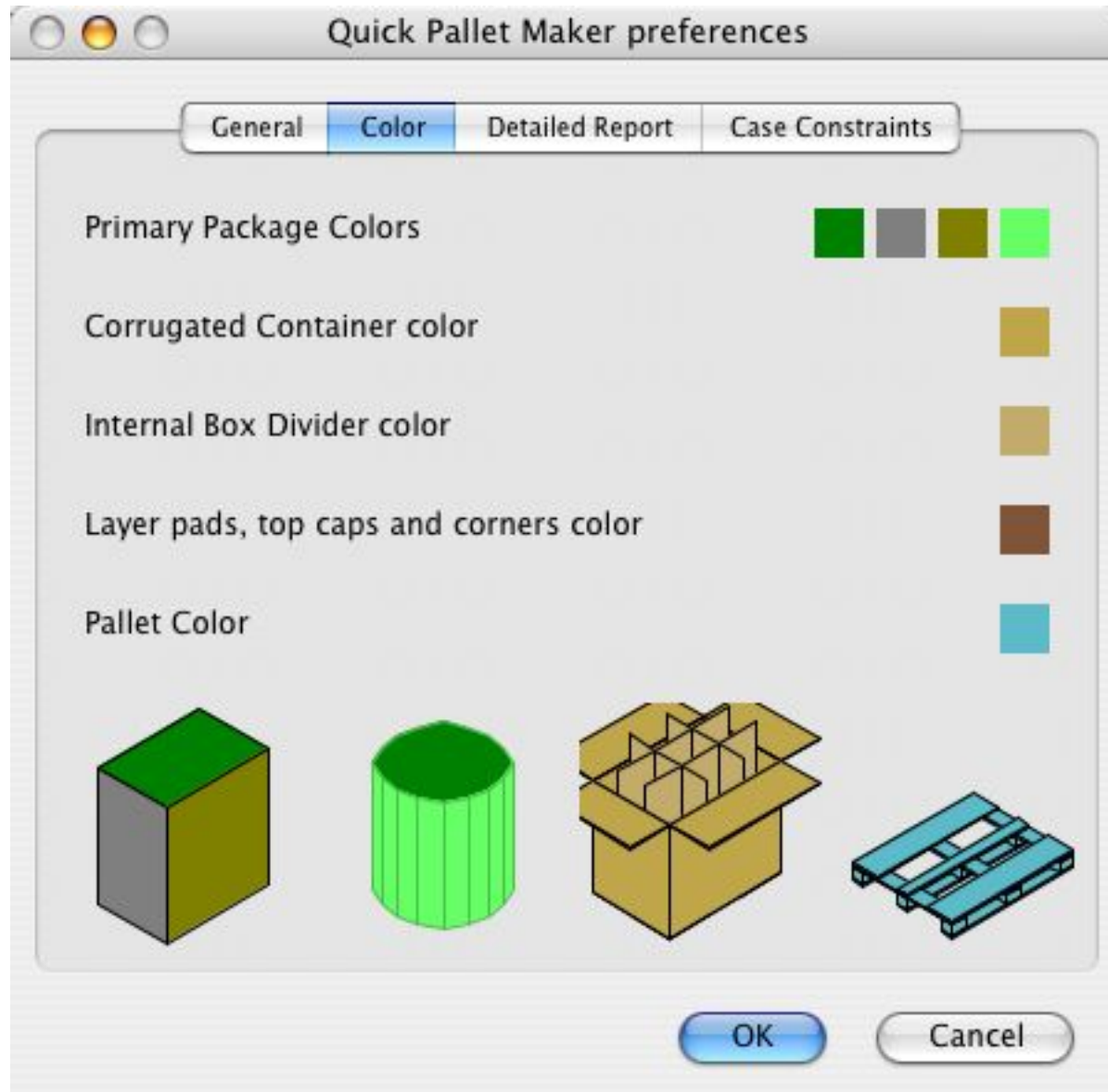
Quick Pallet Maker allows you to change the colors of the Primary Packages (rectangular and cylindrical), boxes, pallets and box dividers. Click on the small colored squares to display the color palette window.

Setting the User Preferences - Detailed Report tab

This section was created so the user could edit the text in the Detailed Report and change the language or just the terminology. To use this feature, click on a phrase in English and edit it in the box below. Selecting "Use Local language" will display the new text in the detailed report window. The HTML report text can also be edited using a text editor to show any language or terminology. This file can be found in the "Templates" folder within the QPM application folder.

Setting the User Preferences - Case Constraints tab

Maximum Primary Package Length: This constraint was meant to prevent the user from accidentally typing in an excessively large value.

Maximum Primary Package Width: Same as above.

Maximum Primary Package Height: Same.

Maximum Primary Package Weight: Same.

Maximum Pallet Length: Same.

Maximum Pallet Width: Same.

Maximum Pallet Height: Same.

Maximum Pallet Weight: Same.

Maximum Case Weight: This is the limit that is dictated by the maximum weight that should be handled. Most regulatory agencies (e.g. OSHA) advise against workers carrying high loads.

Length/Width Ratio: This adjusts the default minimum and maximum ratios for the resulting boxes. This feature allows the program to reduce the calculation time and to provide realistic box sizes. This number compares the external case length with the external case width. Note that by definition, the length should be equal or greater than the width.

Length/Height Ratio: Compares the external case length with the external case height.

Height/Width Ratio: Compares the external case height with the external case width.

Quick Pallet Maker preferences

| General | Color | Detailed Report | Case Constraints |

Maximum Primary Package Length	2000
Maximum Primary Package Width	2000
Maximum Primary Package Height	5000
Maximum Primary Package Weight	50
Maximum Pallet Length	2000
Maximum Pallet Width	2000
Maximum Pallet Height	5000
Maximum Pallet Weight	150
Maximum Case Weight	40
Length/Width Ratio	1	3
Length/Height Ratio	0.5	3
Height/Width Ratio	0.5	3

All Units in mm and kg.

OK   Cancel

Setting the Input Data - Primary Package Input

Quick Pallet Maker provides two methods for loading the input data; start from primary package or start from box. In this chapter, we will explain the input process starting from the PP and from the box windows.

Primary Package Section

The first step the user should take is to set up the information for the Primary Package. The primary package is defined as the largest element that will be packed into boxes. If the user wishes to work with existent boxes and fit them into new spaces, then he/she should start from the box dimensions, which will be explained later. Examples of primary packages are shampoo bottles, tuna fish cans and ice cream boxes.
When setting up the primary package, the user must pick from three basic types of packages:
• Rectangular packages (e.g. milk cartons, books, drug cartons)
• Cylindrical packages (e.g. aerosol cans, tuna fish, cat food, soda cans)
• Bottles (e.g. wine, liquid bleach)

The next step is to choose which one of the dimensions will be allowed vertical to the pallet (upwards or downwards). This option is important because not all of the PP's can be can be stacked in any form. For example, although wine is best kept while lying down, the glass bottles are very fragile when stacked this way. Hence, wine bottles are always placed upwards when shipping. When a PP direction is checked, the program considers that PP direction as an option for stacking upwards. To constrain the PP to fewer positions, simply uncheck some options.

The primary package dimensions represent the external dimensions of the package that is being fit into the boxes. If the package is rectangular, then QPM will request the length, width and height. Otherwise, only the diameter and the height are needed. Remember to allow for package (both PP and box) construction error when introducing these dimensions or else a slightly bigger PP or smaller box may render the calculations useless. In any case, slack can always be added at the end when a box has been chosen. You do not need to expand the dimensions of the primary package when using internal case dividers. QPM adds the thicknesses automatically.

Setting the Input Data - Multiple Primary Package Input

The Multiple PP input is opened by using the appropriate command in the Tools menu.

Quick Pallet Maker presents the user with a window that can be used for:
- Calculating different package types with the same case and pallet constraints, or
- Calculating a shipment with a finite amount of packages.

This window is very similar to the PP input section with the only exception being the possibility of entering the number of primary packages in a shipment. If zero is entered, then QPM assumes that the user does not wish to use the shipment option. Once each package type is added, the list is updated to reflect this.

Load Multiple Packages

Amount 1000   Package Shape Rectangular

Dimensions Allowed Vertical to Pallet   ☑ Length ☑ Width ☑ Height

Length   Width   Height
External Dimensions 5 X 4.44 X 6.88 mm   Weight 1 kg.

#	Amount	Type:	Length	Diameter	Width	Height	Weight	Co...	Co...	Co...	Co...
001	1000	Rectangular	5.00		4.44	6.88	1.00				

Add Package
Edit Package
Import Package
Export Package

Done

Setting the Input Data - Secondary Package Input

Secondary Package Section

Once the primary package information has been completed, the user must specify the characteristics and limitations of the boxes that are to be produced. Note that QPM allows the creation of completely new boxes and/or a selection of off-the-shelf boxes that are summarized in the standard cases and pallets window.

First of all, the user must specify the case count, which is the amount of primary packages per box. Note that if the user wishes to use the fill (standard) case option, then QPM will calculate the maximum amount of packages that can be fit into a standard box, making the case count selection irrelevant.

Next, the box construction should be specified. In this case, QPM will add the board thickness to the internal package dimensions as a function of the amount of corrugate layers that are added to each side of the case and of the thickness of each one of the layers. The board thickness depends mostly on the board construction or the flute type, which are in this case Imperial Unit standards. Please note that in case the box construction does not fit any of the standard options that are displayed, the added thickness values can be manually typed into their respective boxes. A common practice is to measure the physical board thickness and multiply it by the number of times that the board is placed in each box direction. The bulge factor will increase the box size proportionally.

The case constraints were included in Quick Pallet Maker to avoid the creation of unpractical boxes, either by being too small or too large or because the ratios between their dimensions make them too flat, too narrow or too tall. The default values can be changed if the user requires a resulting box that would automatically be rejected by QPM for being too long, for example.

Setting the Input Data - Box Partitions (Dividers)

Internal Case Dividers (Partitions)

Quick Pallet Maker offers the user the ability to include standard internal case dividers inside each box. The dividers that are available are the following:
- Length Divider
- Width Divider
- Z in Length
- Z in Width
- Single Omega
- Double Omega
- Cell partition
- Square Liner
- Double Z
- Length H
- Width H
- Height Divider

The function of the internal dividers is to add compression strength to the cases and to protect the box contents. A common example of the use of dividers is for packing wine bottles into individual cells by using a cell divider. This adds strength to the box and protects the bottles from damaging each other.

Internal Divider Type

Cell Partition

Flute Type

125-250#C Flute

Dimensional Increase

Length   TBD   mm

Width   TBD   mm

Height   0.000 mm

OK   Cancel

Once the divider type has been selected, the user must select the board thickness from the list of standard board types or use a custom thickness. If the user selects a custom option, then the program will display a box where he/she can introduce the thickness. If the length, width or height dividers have been selected, an option appears that allows multiple dividers. The drawing at the right part of the window will update to reflect the new set of dividers. The slider at the right of the drawing moves the dividers up and down, giving the user a better view.

Setting the Input Data - Standard case section

Standard Cases

Quick Pallet Maker features a standard case option that allows the program to select the case with standard dimensions that is closest to the case that results from the calculations. The slack that will be added to the cases or the compression that will be given to achieve this value will depend on the values that the user has specified in the text boxes at the right of this section. For example, if QPM has calculated a case that measures 235 x 190 x 230 mm (external dimensions), it will be approximated to a case measuring 240 x 200 x 230 mm. This box can be easily placed on a 1200 x 1000 mm pallet with 100% area efficiency. For metric unit cases, the user has the option of standardizing (i.e. rounding off) the length and the width only (by setting the standard height to zero in the case list) or the length, width and height (by using positive values in the standard case table). For standard cases using Imperial units (British units), Quick Pallet Maker will approximate the case length, width and height. Packaging facilities that operate only with standard cases have greater chances of packing multiple products efficiently on a pallet. The list of standard cases can be edited in the standard cases and pallets window. The list on this window allows classification of the standard cases for filtering with the small type pull-down menu. For example, if a user creates standard cases and calls some trays and others boxes, he/she can choose which type is used for the calculations.

There are five options for using standard cases:
1.   Do not use standard cases (default)
2.   Use standard cases whenever possible: this option will return the calculated case if a close enough standard case cannot be found.
3.   Use ONLY standard cases: this option will return no results if a close enough standard case cannot be found.
4.   Fill standard cases: QPM will attempt to fit as many packages irregularly into each of the selected standard cases. Fill standard cases with constant case count: this option is similar to the option #3, except that the primary package arrangement within the box can be irregular.

Setting the Input Data - Pallet Input section

Pallet Input Section

Most loads are transported on some type of standard shipping pallet. This represents a convenient method of stacking and storing in warehouses and loading into trucks and containers. Forklift trucks are used to quickly shift the pallets from one place to the other. The user can pick from a list of standard pallets or type in the dimension of the pallet she/he chose. Another option is to not use any pallet at all by entering zero for all dimensions. The pallet has an associated weight and must be entered to calculate the box compression resistance once the solutions are obtained. The list of standard pallets can be edited from the Standard Cases and Pallets window along with the default pallet. Once the shipping pallet has been specified, the user must determine the minimum and maximum load dimensions. This will allow the program to reach a solution quickly. The minimum load length and width will determine the maximum underhang that is allowed on the pallet sides. These dimensions are indicators of the acceptable area efficiency, while the minimum load height is an indicator of the lowest volume efficiency. If you are unsure of the minimum values, zeroes can be entered so the program accepts any pallet.

The maximum load length and width are usually constrained to the pallet length and width, as overhang is usually unacceptable (hence the default values). However, the user may override the default values and type in the values he/she chooses. When shipping directly into a truck or container, the maximum dimensions will correspond to the truck or container dimensions. The maximum load weight should include both shipping pallet and load. Most of the time, this value will be limited by the maximum weight that the plant forklift trucks can carry. Please ask the logistics supervisors at the plants and/or distribution centre for this value.

## Setting the Input Data - Units and Data

Changing the work units

Prior to the introduction of data, the user must select the work units for his/her project. You can also set the default units in the Preferences (Settings) window in case you usually use the same unit type. QPM allows millimeters, centimeters and inches as length units and kilograms or pounds as weight units. The combinations are mm/kg, cm/kg and in/lbs. If the units are changed after some data has been introduced, the data will be lost.

We figured this would be better than having the user enter some data thinking that the units are correct and then QPM converting them to useless data. To change the units, the user must choose an option from the Tools menu (see picture). The round numbers option will limit the decimals to zero for the resulting case and load (length) dimensions. This is highly recommended when using mm and it is discouraged when using inches (as an inch is a larger unit). For centimeters, it's up to the user.
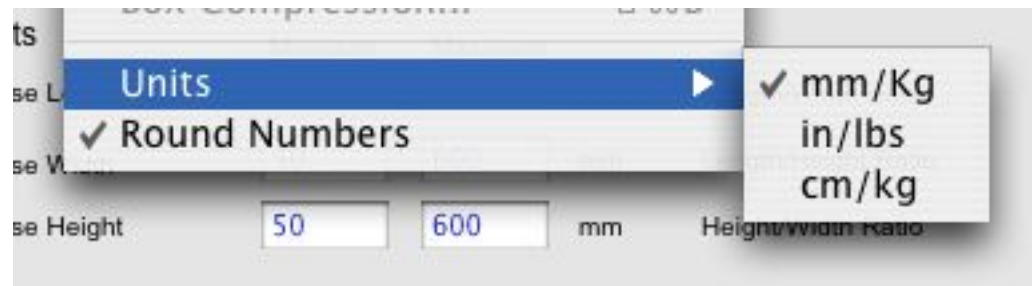
Saving and Opening Input Data

Quick Pallet Maker allows the user to save the Input Data onto a local (i.e. hard) or network disk or other media through the Save command. Save and Open windows act in the same form as most application windows for the Operating System that you are working with (Windows or Macintosh). QPM works with three file types: input files (.qpm), report files (.txt) and box files (.box).
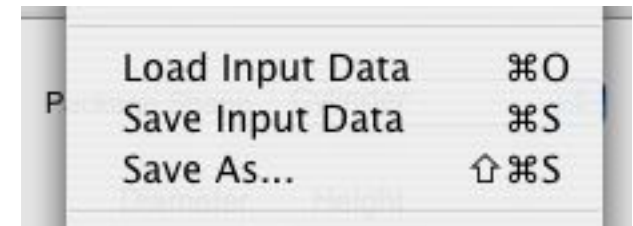
The QPM file is a text file that can be read by any application that can read text files. Tampering with the file may render it useless. On Windows and Mac OSX machines, this file will include the "qpm" extension. If using Mac OS Classic, the file will carry no extension. The information that is contained includes units settings and whether the application will use round numbers or not, besides all the information on the main Input Window and the Dividers window. To see the name of the file in use, select the Window menu. The experienced user will note that double-clicking a QPM input file is more practical than looking for the QPM applications and loading the file from there. Report files contain all the information from a pallet while Box files contain the information from a box.

Setting the Standard Cases, Pallets and Containers window

Setting up the Standard Cases, Pallets and Containers window:

Whenever a new document is called, QPM will open a window that contains the standard cases and pallets. It can also be opened by selecting the appropriate item in the Window menu. This window contains two tabs:
• The first tab contains a list of Imperial unit standard cases, a list of Metric unit cases and selectors to choose whether the program will consider the dimensions in the list as external or internal dimensions. This tab also contains drawings of the selected boxes.
• The second tab contains a list of standard pallets with a pull-down menu to select the default pallet, a pallet drawing and a checkbox in which the user can decide whether to show the pallet as a four-way wooden pallet or as a slab. This tab also contains a list of standard containers, a pull-down menu to decide which one will be the default and a simple container drawing.

To create a new item in any of the lists (new container functionality will be introduced in QPM 3.3), select any item from a list and choose "Duplicate" from the Edit menu. A duplicate pallet or box will appear at the bottom of the list. Click on the element you wish to edit and change the values directly in the table. This new pallet or box will be saved upon quitting the application.

To enable a standard box (for it to be included in the calculations), check the box that is at the beginning of each row. To disable it, uncheck it. This is specially important for the fill box feature. If too many boxes are enabled, the application will take too long to calculate the different box fill options. Note that you can establish the type for each one of the boxes and then filter the boxes in the calculations. The latter is more efficient than enabling or disabling the boxes.

To select the default pallet or container, choose it from the pull-down menu located above the pallet list.
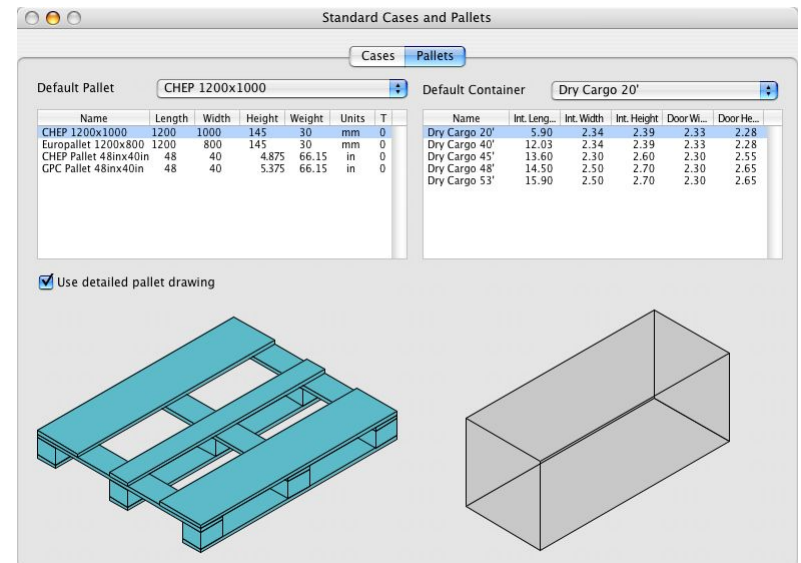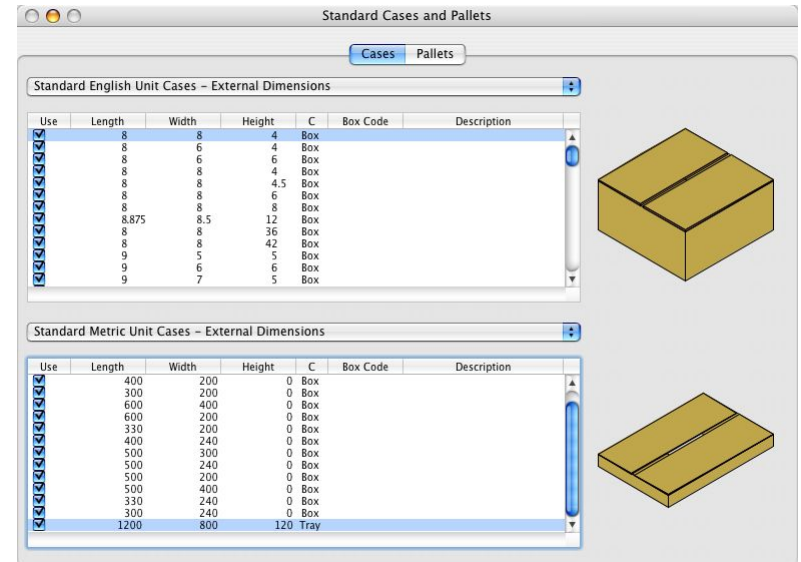
Setting the Input Data - Starting from Box Dimensions

Starting from box dimensions:

The Input Window is different when starting from box dimensions. This window contains a box construction section, a box input section and the pallet data section. The part that differs from the Start from PP input window is the box input section.

The user can either create a completely new (empty) box or import a saved box. To create a new box, enter the dimensions in the text boxes left of the boxes table and then press the "Add Box" button. The "Import Box" button will open a window in which the user can select the box that will be added to the list. A message will appear if the units differ from those in the window. The Start from Box window also contains three checkboxes (the third checkbox is disabled) that determine which case dimension can be stacked vertical to the pallet.

Input Data – Untitled 1

Case Information

Construction: RSC – Regular Slotted Container

125–250#B Flute

Board Thickness (LengthxWidthxHeight)
0.25 X 0.25 X 0.50 in

Case Dimensions

n	Length	Width	Height	L	W	H
0001	9.19	7.19	15.62	2	1	3

	Int.	Ext.	
Length	0	0	in
Width	0	0	in
Height	0	0	in
Weight	0		lbs

Add Box   Import Box...

Dimensions Allowed Vertical to Pallet
☐ Length
☐ Width
☑ Height

Pallet Dimensions

CHEP 1200x1000

	Length	Width	Height	
	47 X	39 X	6	in

Weight 66 lbs

☐ Try all standard pallets

Load Properties (Including Pallet)

	Length	Width	Height	
Min Load Dimensions	20 X	20 X	6	in
Max Load Dimensions	47 X	39 X	53	in

Max Load Weight 1500 lbs

All units in inches and lbs.

Analyzing Calculation Results

Analyzing Results

To obtain the results for the input data that has been
introduced, the user must select the Recalculate command
from the Tools menu (see picture). If the program couldn't
find at least solution that would abide with the input
data, a message box will appear. Most of the time it may
be related to the limitations that are used. If this
occurs, then the solution ranges must be made wider. If
this issue is recurrent, please send an email to
support@koona.com and one of our technicians will assist

Case Results

If the application has recalculated successfully, the
user will be presented with at least one case configuration
and at least one pallet. A drawing of the selected case
will appear below the list of cases that were obtained.
By clicking on a solution, the drawing will update to
match it. Once the box table has been clicked, the user
can move between boxes with the up and down keys. A pull-
down menu is available by clicking the drawing with the
right mouse button (ctrl + click on a one-button Mac)
where the user can choose from saving or importing a box,
selecting from different box views or copying the box
drawing to a third-party application. The colors of the
PP match those of the Input Window or the multiple PP
input window. The last three columns of the box table
indicate the number of primary packages per case length,
case width and case height, respectively. If the box has
been filled irregularly, then these columns will not carry
any numbers. Although internal dividers are not pictured
in the case drawings, they are taken into account during
the calculations. Standard cases are represented in white
letters on a blue black background. A slider at the right
of the drawing moves the primary packages up and down.

Analysing Calculation Results - Pallet Data

For each case that has been obtained, QPM will generate automatically three pallets. The first pallet is the result of fitting the case length into the pallet length and the case width into the pallet width (pallet type #1). Ordering the case length into the pallet width produces the second pallet (type #2). The third automatic pallet (type #10) is produced through a custom algorithm that optimizes the pallets automatically. The last column on the pallet table will indicate the type of pallet. Navigating with the pallet results table will update the box for the pallet that has been selected. Each pallet on the table contains the following information:

- Pallet Number
- Box external length
- Box external width
- Box external height
- Box weight
- Knocked Down Flat (KDF) board area
- Cases per pallet length
- Cases per pallet width
- Cases per pallet height (number of layers)
- Cases per layer
- Total cases per pallet (number of layers x cases per layer)
- Load length (not including the physical pallet)
- Load width (not including pallet)
- Load height (not including pallet)
- Load weight (including pallet)
- Area efficiency (%)
- Volume efficiency (%)
- Pallet type

Available Solutions – Untitled 1

Primary Package Information
Primary Package Length 5.00
Primary Package Width 4.44
Primary Package Height 6.88
Primary Package Weight 1.00

Pallet Number 0001

Case Information
Case Count 6
Int./External Case Length 8.88/9.13
Int./External Case Width 6.88/7.13
Int./External Case Height 15.00/15.50
Filled Case Weight 6.43

Cases in Pallet Information
Cases per Pallet Length
Cases per Pallet Width
Number of Layers 3
Cases per Layer 27
Total Cases per Pallet 81

Pallet Area Efficiency 91.54%
Pallet Volume Efficiency 88.74%

Feasible Pallets 252

Number of Feasible Cases 84
Number of Standard Cases N/A

| n	Length	Width	Height	L	W	H
0018	14.01	4.69	10.50	2	1	2
0019	9.13	5.25	14.26	2	1	2
0020	14.01	5.25	9.38	2	1	2
0021	10.25	7.13	9.38	2	1	2
0022	15.25	9.13	7.38	3	2	1
0023	13.57	10.25	7.38	3	2	1
0024	13.57	7.13	10.50	3	1	2
0025	13.57	5.25	14.26	3	1	2
0026	15.25	7.13	9.38	3	1	2
0027	9.13	7.13	15.50	2	1	3

Optimize   Go

Load Dimensions | Not Including Pallet | Including Pallet
Load Length | 45.65 | 48.00
Load Width | 39.65 | 40.00
Load Height | 46.50 | 51.38
Load Weight | 520.90 | 587.05

Total Primary Packages per Pallet **486**

Enlarge boxes 9.13 X 7.13 X 15.50

Sol	Box L	Box W	Box H	Box We	Area	CxLen	CxWid	CxHght	CxLay	Total	L Len...	L Width	L Heig...	L Wei...	Area Ef.	Vol Ef.	Code
0001	9.13	7.13	15.50	6.43	757.24			3	27	81	45.65	39.65	46.50	587.05	91.54%	88.74%	10
0002	20.89	9.13	15.50	18.85	1500.10			3	9	27	45.65	39.15	46.50	575.20	89.40%	86.67%	10
0003	7.13	5.25	9.38	2.21	375.14			5	48	240	47.25	39.02	46.90	597.38	93.58%	91.43%	10
0004	14.01	5.25	9.38	4.33	576.45			5	24	120	47.28	38.52	46.90	585.51	91.94%	89.82%	10
0005	15.25	9.13	14.26	12.66	1160.10			3	13	39	45.75	39.63	42.78	559.90	94.27%	84.77%	10
0006	18.01	7.13	15.50	12.66	1159.15			3	13	39	46.53	36.02	46.50	559.87	86.95%	84.29%	10

Analysing Calculation Results - Pallet Types

The following drawings show the different pallet types that QPM can generate. From left to right and from top to bottom they are:

• Type 1 pallet: This pallet is created automatically when the user chooses "Recalculate" from the Tools menu. The boxes are arranged lengthwise.

• Type 3 pallet: The user chose the type 1 pallet and optimized it. QPM tries to shift the rows in order to add more cases per layer.

• Type 14 pallet: Length display pallet. Also called pinwheel, this pallet is created by choosing "Display Length" from the Actions menu in the Results Window and later alternating the layers in the resulting pallet. This type of pallet is specially useful for displaying a single face to the consumer in "Club Stores" and other outlets where the pallet are visible to the consumer.

• Type 15 pallet: Pinwheeel pallet that displays the box width instead of the box length.

• Type 2 pallet: This pallet is created automatically. The boxes are arranged transversally to the pallet.

• Type 4 pallet: This pallet is created by optimizing type 2 pallets.

• Type 10 pallet: It is created automatically and is a result of an optimization algorithm. It is important to scan through the different pallet types in order to achieve the highest possible area efficiency.

• Type 6 pallet: This pallet is called "mixed pallet" and is obtained by selecting a number of different pallets and grouping their layers (by list order) into a new pallet.

• Type 20 pallet: Can be created by starting from case dimensions or by selecting "Optimize and Flip cases" from the Action menu. This pallet contains layers of cases that have been placed on their sides.

• Type 30 pallet: Created by starting from case dimensions or by selecting "Mix layers and optimize in height" from the Action menu. Contains layers of boxes placed on their sides and mixed to optimize the amount of them that fit in the pallet load space.

• Type 40 pallet (not shown): practically any pallet through the Layer Editor.
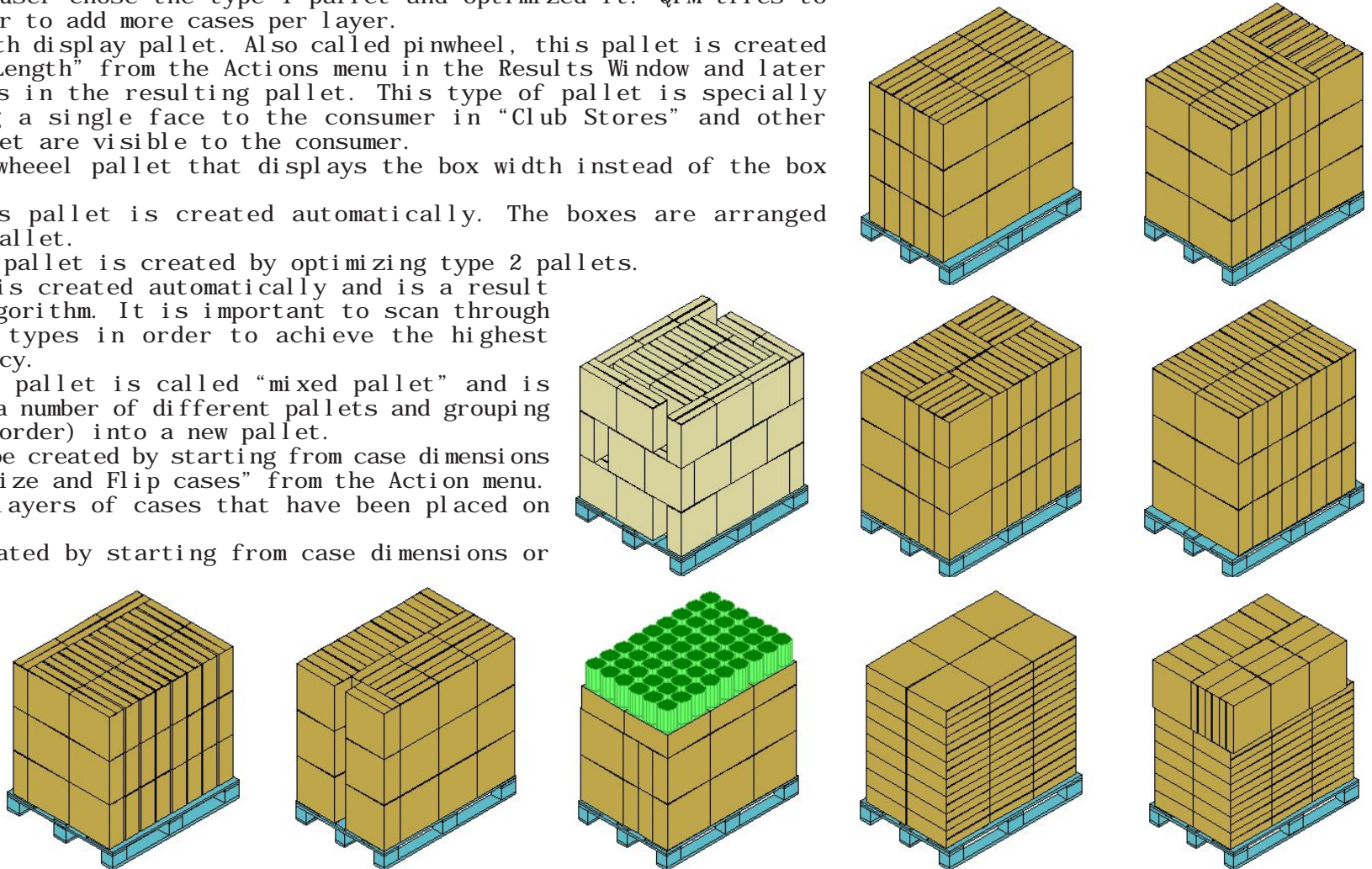
Analysing Calculation Results - Sorting and Slack

The pallet results can be sorted according to the criteria that the user deems most relevant. Selecting "Power Sort" from the Tools menu will activate this function. A window similar to the one below will appear. The user can pick from two types of criteria. For example, a reasonable sorting procedure would be to select the "Primary Packages per Pallet" as the first criterion in descending order and the corrugate area as the second criterion in ascending order. This will allow to select the pallet that saves the most money by a) fitting more cases per pallet and b) by using boxes with less board area (less corrugate board per box).

Sorting Criteria #1: [Total Primary Pack...] Order: [Descending]

Sorting Criteria #2: [None] Order: [Descending]

[OK] [Cancel]
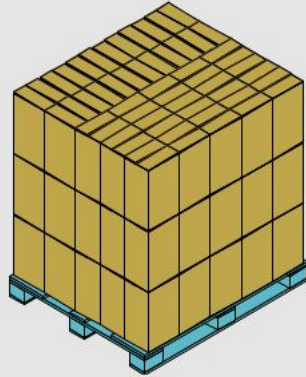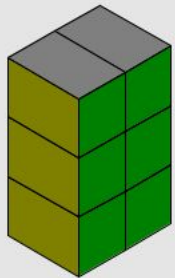
QPM provides an efficient way to add internal slack to the cases. The user clicks on the preferred pallet and the external box dimensions will appear in rectangular boxes as in the drawing at right. Note that the box data is for the first box in the pallet (bottom layer, back row) and that if you are to create a mixed pallet, you will need to add slack to the boxes before mixing them. The featured dimensions are case length, case width and case height. As the user types a new value, QPM will create a new pallet solution with these boxes. If the values are increased too much, then QPM will create a new arrangement with less boxes per layer. This feature can only add slack to the boxes. If you wish to compress the box contents, then go back to the Input Window (use "Change Data" from the Tools menu and then enter smaller primary packages).

Available Solutions – Untitled 1

Primary Package Information
Primary Package Length	5.00
Primary Package Width	4.44
Primary Package Height	6.88
Primary Package Weight	1.00

Pallet Number 0001

Case Information
Case Count	6
Int./External Case Length	8.88/9.13
Int./External Case Width	6.88/7.13
Int./External Case Height	15.00/15.50
Filled Case Weight	6.43

Cases in Pallet Information
Cases per Pallet Length	
Cases per Pallet Width	
Number of Layers	3
Cases per Layer	27
Total Cases per Pallet	81

| Pallet Area Efficiency | 91.54% |
| Pallet Volume Efficiency | 88.74% |

Feasible Pallets 252

Number of Feasible Cases 84

Number of Standard Cases N/A

n	Length	Width	Height	L	W	H
0018	14.01	4.69	10.50	2	1	2
0019	9.13	5.25	14.26	2	1	2
0020	14.01	5.25	9.38	2	1	2
0021	10.25	7.13	9.38	2	1	2
0022	15.25	9.13	7.38	3	2	1
0023	13.57	10.25	7.38	3	2	1
0024	13.57	7.13	10.50	3	1	2
0025	13.57	5.25	14.26	3	1	2
0026	15.25	7.13	9.38	3	1	2
0027	9.13	7.13	15.50	2	1	3

[Optimize] [Go]

Load Dimensions		Not Including Pallet	Including Pallet
Load Length		45.65	48.00
Load Width		39.65	40.00
Load Height		46.50	51.38
Load Weight		520.90	587.05

| Total Primary Packages per Pallet | 486 |

Enlarge boxes [9.13] X [7.13] X [15.50]

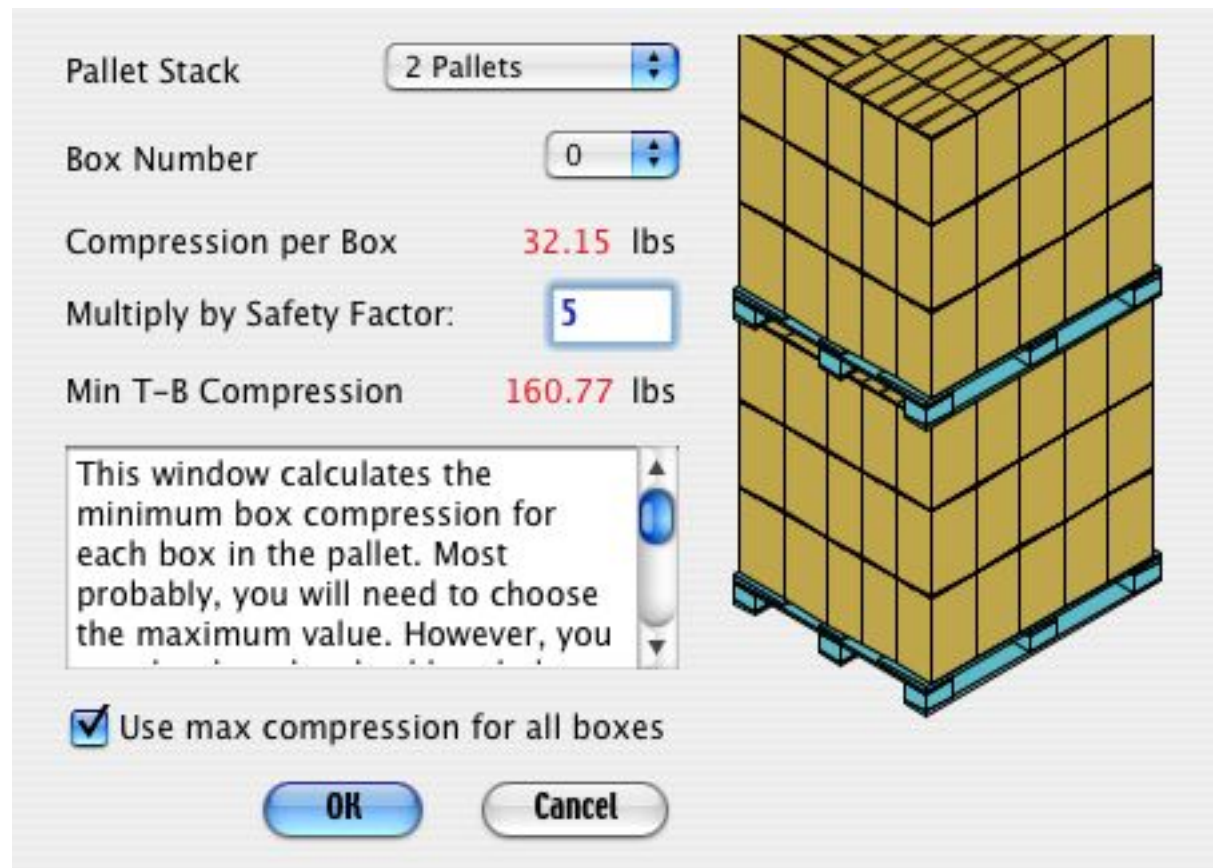| Sol	Box L	Box W	Box H	Box We	Area	CxLen	CxWid	CxHght	CxLay	Total	L Len...	L Width	L Heig...	L Wei...	Area Ef.	Vol Ef.	Code
0001	9.13	7.13	15.50	6.43	757.24			3	27	81	45.65	39.65	46.50	587.05	91.54%	88.74%	10
0002	20.89	9.13	15.50	18.85	1500.10			3	9	27	45.65	39.15	46.50	575.20	89.40%	86.67%	10
0003	7.13	5.25	9.38	2.21	375.14			5	48	240	47.25	39.02	46.90	597.38	93.58%	91.43%	10
0004	14.01	5.25	9.38	4.33	576.45			5	24	120	47.28	38.52	46.90	585.51	91.94%	89.82%	10
0005	15.25	9.13	14.26	12.66	1160.10			3	13	39	45.75	39.63	42.78	559.90	94.27%	84.77%	10
0006	18.01	7.13	15.50	12.66	1159.15			3	13	39	46.53	36.02	46.50	559.87	86.95%	84.29%	10

Analysing Calculation Results - Box Strength Analysis

Box Strength Analysis

Quick Pallet Maker provides the user a method of calculating the minimum top-to-bottom compression strength that the loaded case must stand. QPM calculates the weight that the boxes support and multiplies that number by a safety factor. The weight on each box is a function of the number of pallets that are stacked on top of each other. The user can set this value to a maximum stack of 6 pallets. If the checkbox is selected, then QPM will use the displayed compression value for all the boxes in the pallet, which is the recommended procedure (to use the compression of the bottom boxes). The most important part in this procedure is to set the safety factor. Under perfect warehousing and shipping conditions (no humidity, perfect stacking, constant corrugate strength and zero vibrations), this SF would be equal to the minimum value of 1. However, in real life all these factors must be taken into account.

If your company is not acquainted with the safety factor that is used, our first suggestion is to speak with your box vendor. The boxes that your company purchases should display their strength on the bottom of the case. If not, the vendor may let you know. Finding out your current safety factor may help you know what value is safe. However, this should involve other levels of management like the Quality Assurance department, Plant Management, Logistics, Warehousing, Purchasing, etc. Koona, LLC nor SCA Mecanica, S.A. can not be held accountable for any liabilities involving an incorrect selection of this value.

The screenshot at right contains an example of how pallets are to be stacked on top of each other in pairs and how the maximum compression was calculated for all the boxes equal to the lowest box (box #0) with a safety factor of 5.

Pallet Stack	2 Pallets
Box Number	0
Compression per Box	32.15 lbs
Multiply by Safety Factor:	5
Min T-B Compression	160.77 lbs

This window calculates the minimum box compression for each box in the pallet. Most probably, you will need to choose the maximum value. However, you

☑ Use max compression for all boxes

OK   Cancel

Analysing Calculation Results

Copying results to Spreadsheets

The pallet results that are displayed in the table at the bottom of the Output Window can be copied to any application that accepts copy and paste. To do this, select the pallets you wish to copy and select the copy command. This procedure is useful in case the user wishes to present various output options. The detailed information can also be copied to a spreadsheet by selecting "Export Text" from the File menu.

Saving Pallet solutions:

QPM provides a means to save a large set of pallet solutions to be opened later within the Solutions Window. Select a range of solutions from the pallet list and then the "Save Solutions" item from the File menu. To import previously saved solutions, select "Import Solutions" and the list of pallets in a specific folder will be copied into your list of solutions. This is specially useful for creating mixed pallets that contain different types of boxes.

Layer Editor (see right)

Select "Layer Editor" from the Tools menu to open a window that allows you to move and rotate any of the boxes in the pallet. Select a pallet layer and a box and then edit the location to move the boxes. This feature opens a wide range of possibilities for your pallets. This window allows the user to insert a box (by using the appropriate command from the File menu), flip the boxes in any axis, change their position with the keyboard or by dragging with the mouse. The box movements are limited by the available space in the pallet (e.g. the boxes in the bottom layer cannot be moved vertically most of the time). There are different views available in the Layer Editor: the selected layer can be changed by the menu at the top of the window, the selected box can be changed by either using the second menu or by clicking on the box in any of the isometric views. The isometric views can be toggled by using the appropriate menu item in the Tools menu. The radio buttons allow a view of only the selected layer or of all the pallet layers. The next three buttons will rotate the box in each of the 3 axis: z = vertical axis, x = lengthwise to pallet and y = transversal with pallet. The "Organize Boxes" button should be pressed whenever the pallet drawing does not look well in order to draw the boxes in the right order. The "Copy Selected Layer" button will create a pallet that is made of layers identical to the selected layer. This is especially time-saving for creating custom pallets. Note that the maximum height of this new pallet is determined by the initial settings. The next three text boxes allow the user to change the box location and to limit the box movements while dragging with the mouse.
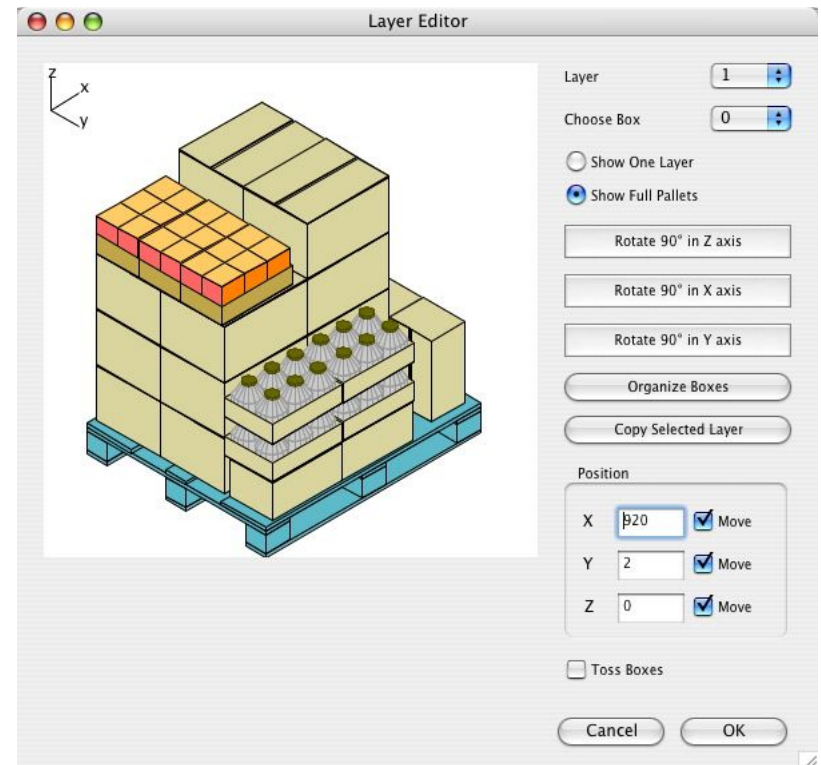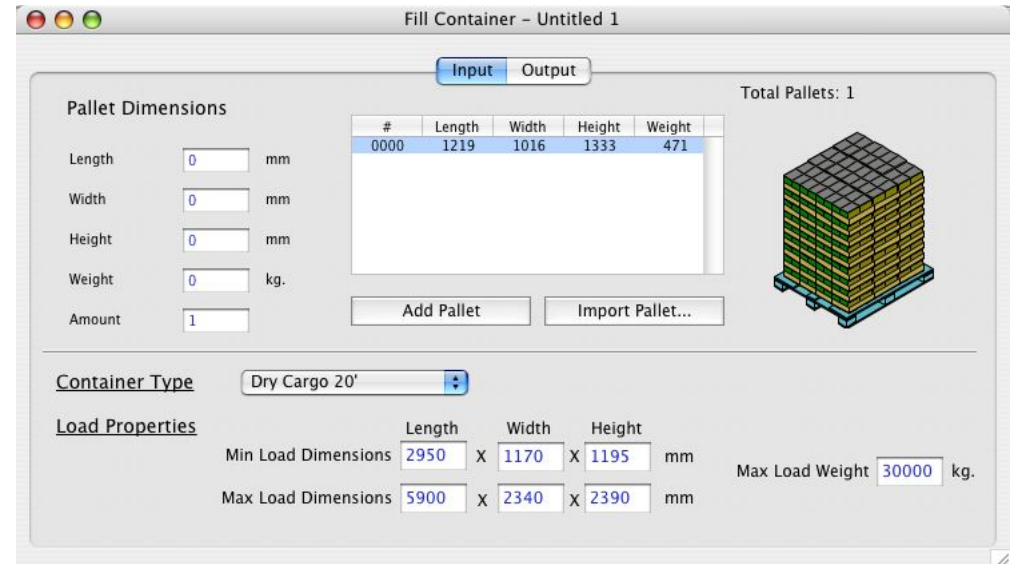
Analysing Calculation Results

Container fill (see right)

The pallets in the solutions window can be used to calculate container loads by either filling as many pallets as possible into a given container or by loading a finite number of pallets into a container. Future program updates will include the possibility of filling containers with combinations of pallets, boxes and drums with different dimensions. To use this feature, select "Fill Container" from the Tools menu and add pallets to the list or use the pallets you had selected prior to opening the container load function. After adjusting the container load constraints, you can click on the second tab in the window to see the container drawing.

Exporting Box Coordinates

As a service to companies that need to export the box location data to machines such as automatic palletizers, QPM offers the box coordinates export option which can be accessed from the File menu. Select the pallet that you wish to export and QPM will create a comma-delimited file (with the CSV extension) that contains four columns: box number, x position, y position, z position and orientation. The orientation ranges from 0 to 5 as explained below:
0.   Right-side up and lengthwise to pallet length
1.   Right-side up and transversal to pallet
2.   Box width is vertical (i.e. is standing on its side) and length is aligned with pallet length.
3.   Box width is vertical and height is aligned with pallet length
4.   Box length is vertical (i.e. is standing on its end) and width is aligned with pallet length.
5.   Box length is vertical and height is aligned with pallet length.
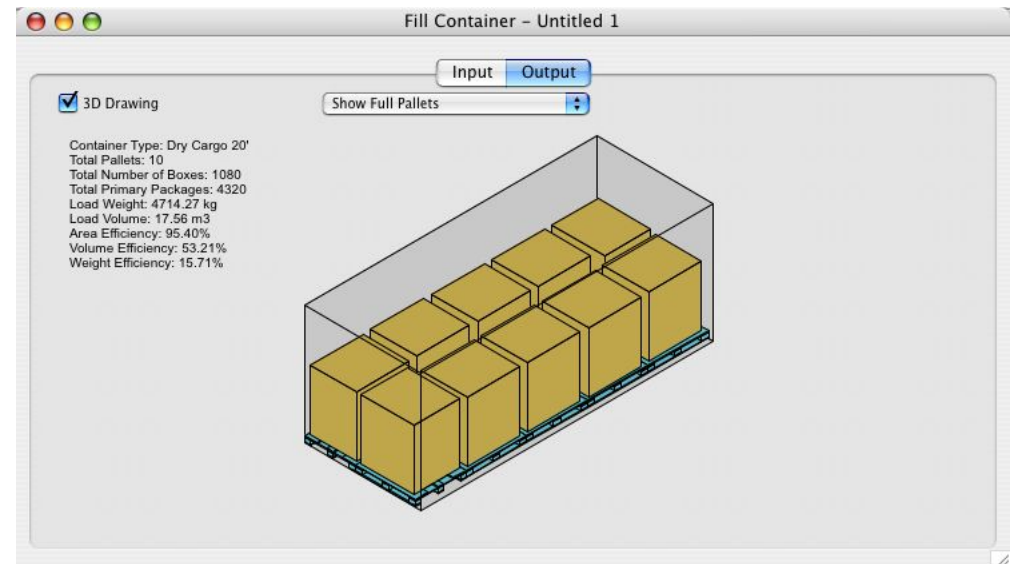
Analysing Calculation Results - Creating Shipments

Creating shipments

As mentioned in the multiple PP input window section, a user can enter a finite number of primary packages to calculate how many pallets and boxes are needed to complete a shipment.

Selecting "Create Shipment" from the Tools menu with an optimal pallet selected will erase all the pallets in the list and just add as many that are required to complete the shipment. In most cases, the last pallet of the list will be incomplete and only contain as many boxes as needed. This feature can be combined with the Fill Container feature to see how much space will the shipment occupy in a said container. This is done by selecting all the pallets in the list, selecting then "Fill Container", selecting all the pallets in the smaller list in the Container Fill window and then clicking on the second tab. If the amount of pallets exceed the container capacity, then the window will show a full container. If you want to see how the incomplete container looks, go back to the first tab in the Container Window and then deselect the number of pallets that fit into the container. Continue deselecting pallets by group until you can obtain the last container. This will be made more automatic in future QPM revisions.
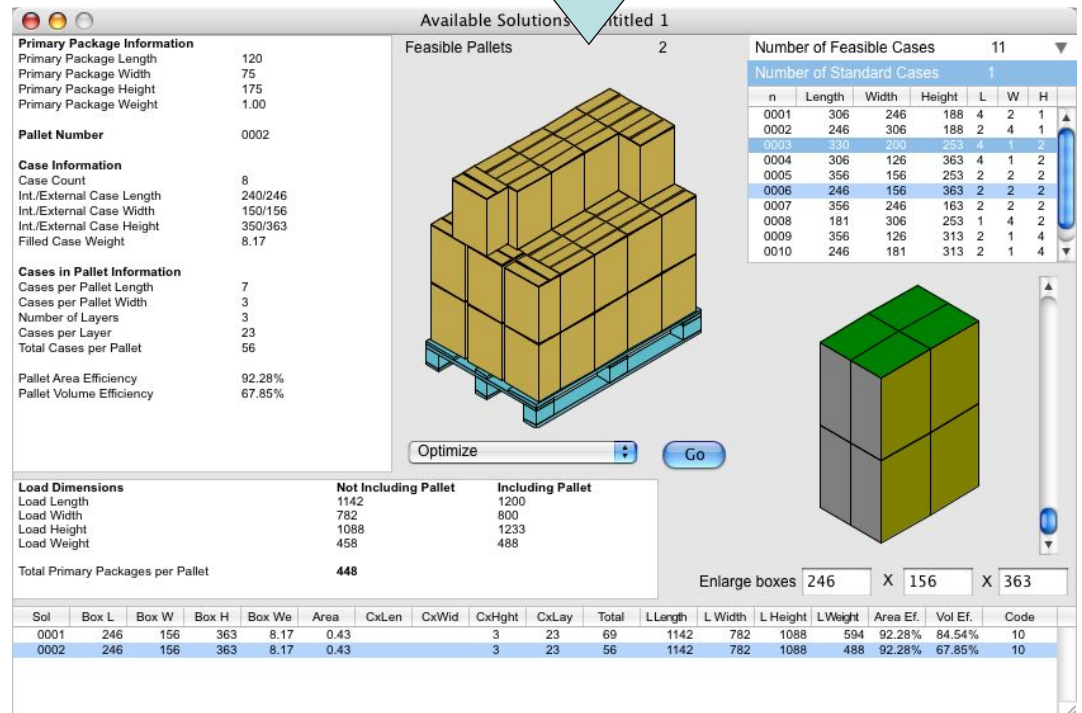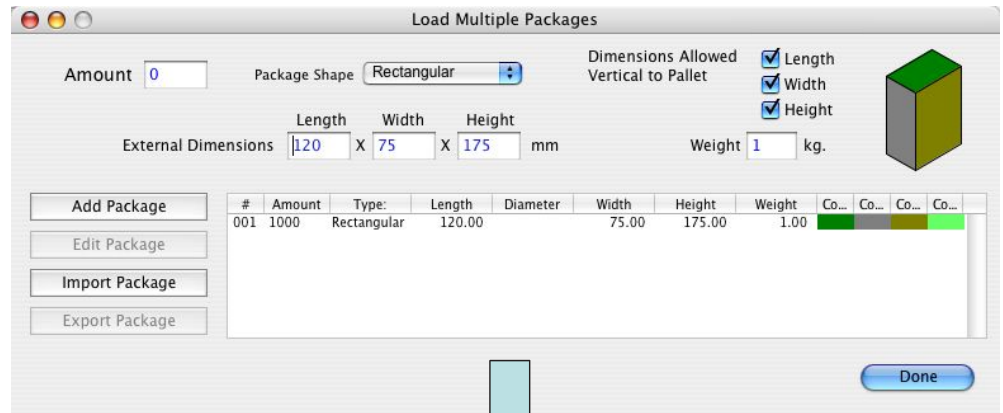
Working with Reports - Report Types

Working with Reports

Quick Pallet Maker can generate a Detailed Report that contains all the information that was used to obtain a particular solution. This includes the Input and all the Output Data. The Report Window appears when the user selects "Detailed Report" and has four tabs:

• Quick Report: contains the detailed report information and presents the primary package (when starting from PP), the box and the pallet drawings. The box can be chosen with the slider below the drawing. This report can be printed in landscape mode (as seen).

• HTML: The text on this tab is an HTML document that is previewed in a web browser (e.g. Internet Explorer). This text can be edited through the window at left and contains the necessary input and output data. When previewing with a browser (and later printing), the document will show the drawings that were checked in the HTML tab.

• Pallet Views: this tab contains four pallet views. The user can shift between views by using the Toggle view command in the View menu to obtain a larger (printable) drawing.

• KDF drawing: The last tab in the report window will show the blueprints of the selected box.

Working with Reports

Working with statistical units

The report displays a small window on the bottom where the user can type in a statistical factor. This factor represents the amount of primary packages that the company considers to be a statistical unit. For example, if a paper company sells notebooks in SU's of 220 notebooks/SU, then QPM will display the amount of statistical units that are carried per pallet. In this way, the logistics department will be certain of the amount of pallets to ship depending on a specific order. This can be hidden by clicking on the disclosure triangle at the bottom-right corner.

Printing the Report

QPM can produce four different printouts (one per window tab): a landscape option that replicates the first panel of the Detailed Report window, a portrait option that is printed through the HTML preview in web browser, the selected pallet view and the KDF (box) drawing. Except the HTML output (that uses an ubiquitous web browser), all options can be printed directly within Quick Pallet Maker. To use Black & White printers, select B&W from the View menu and the drawings will update appropriately.

Exporting the Report

The user can select from text-only export, MS Excel export, graphics export or a palletizing movie export, besides being able to copy the report graphics and any individual drawing in the first tab to a third-party application. Text-only export is useful for creating custom reports, as it will save all the information in a text format that can be read by common word processors and text editors. The MS Excel report creates a tab-delimited file that can easily be opened by Excel or by others spreadsheets that can open tab-delimited files. The user can export both text and graphics separately to create a custom report that includes the PP, box, internal box dividers and pallet drawings.

Movie export

A major feature of QPM is the ability to save movies (i.e. computer animations) that describe the pallet loading process. This compressed movie file can later be shared with colleagues to describe EXACTLY what is meant in the pallet loading process. To export a movie, select "Export Movie" from the File menu (free QuickTime required). The program will ask you the name of the file and where would you like to save it. After this has been done, the program will start drawing each movie frame and saving them to disk. After each frame has been recorded, you will be asked to select the compression settings. Increasing the quality will create a larger file with a better resolution. We recommend using "Animation" with thousands of colors. When this window has been closed, your movie is saved.

Adding graphics and text to the report

The standard QPM report displays a window at the left side of the report. The user may copy and paste or drag any picture he/she wishes in that section. This only works with pictures, as any text will be pasted onto the statistical units section or into the comments section. If the user insists on placing text into the logo window, a trick is to generate the text with a painting program and copying it as graphics. Custom text can be added to the section at the lower right corner of the report window. This text will be saved along with the report and printed.

## Working with Reports

Custom reports

The second tab in the detailed report window contains an HTML text editor with the main report information and five drawings at the right. These drawings can be printed distinctively by marking the checkboxes at the left. Right-clicking on the drawings (ctrl+click on a one-button Mac), will reveal a menu that changes the drawing types. The text font and size can be changed by using the commands under the Edit menu.

Multiple pallet views

The third tab in the report window contains a drawing that can show multiple views of the resulting pallet: top, left, front and isometric. These views can be shown at once or one by one by using the "Toggle Pallet View" command in the View menu. This drawing can be copied or printed.

KDF view:

The fourth and last tab in the report will show a drawing of a flat RSC box with dimensions. This drawing can be copied or printed to provide the box manufacturer with specifications for construction.
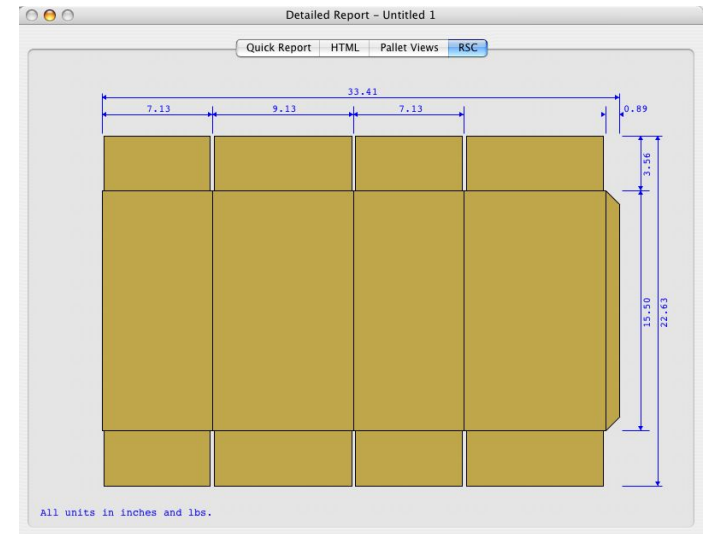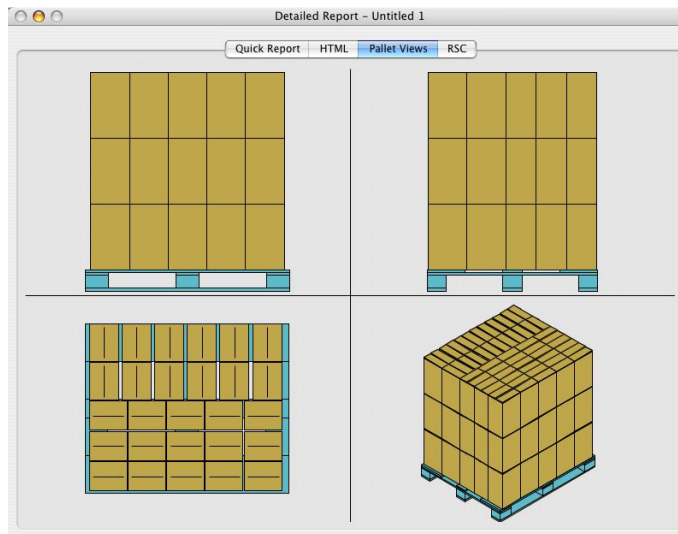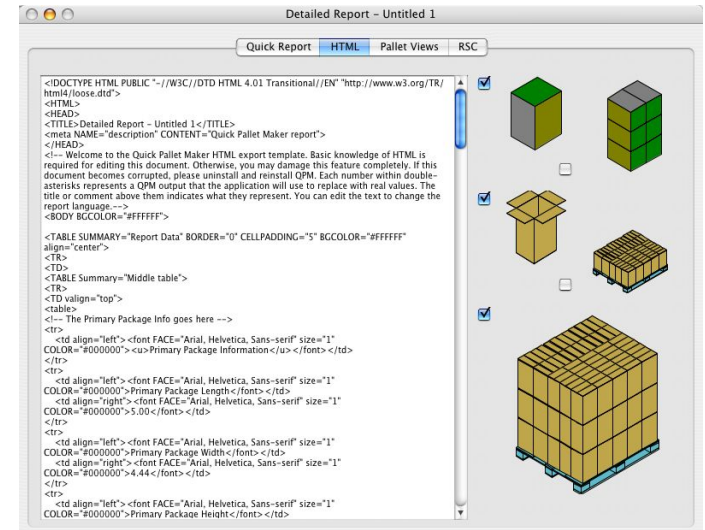
Advanced Input Data

Using the Advanced Input features
Sometimes it is necessary to solve a packaging problem that involves testing how the loads will react to changes in input data. QPM has introduced a method that calculates all the solutions in a given range and selects those that fit a certain criteria. This feature is called the Advanced Input Option. When the AIO feature has been selected, a window similar to the window below will appear. This method eliminates the guesswork from a packaging decision and speeds up results.

Input types
The input type is the value that will be varied in a determined interval. QPM provides the user the possibility of varying the primary package weight, the PP length (or diameter), the PP width, the PP height, the case count, the maximum load height and the maximum load weight. When any of these options are selected, the ranges will update to present reasonable default values.

Output types
The output type is the target value that the user wishes to obtain. The options are:
- board area per box
- cases per layer
- total cases per pallet
- area efficiency
- volume efficiency
- primary packages per pallet

The latter four are indicators of pallet efficiency. These targets can be met with six different criteria: a) greater than, b) less than, c) in between, d) equal to, e) as low as possible or f) as high as possible. When selecting a, b or d, the user will be prompted with one value. Choosing option c) will prompt the user with two values. The latter two options do not require values. If e) or f) are chosen, the user must pick between displaying a list of results or the pallets for just the best result.

Constant volume option
QPM offers an option to vary the primary package dimensions while keeping the PP volume constant. This is useful for designing packages for products that are sold by volume and/or weight and need to be optimized for shipping. When varying one of the primary package dimensions, the user can select the constant volume option and the program will adjust the remaining dimensions to accommodate for the change in the main dimension. For example, if the user is varying the PP diameter in a food can, Quick Pallet Maker will change the PP height to keep the volume constant.

Viewing the Results
After iterating, QPM will move onto the Results Window to display the available solutions. If working with the best result, the number of available pallets will be smaller and will refer to the winning value for the previously selected variable. If there are a large number of pallets, QPM will sort the results in order to list the optimal pallet at the top. This list of pallets can be viewed normally.

Quick Pallet Maker Menus

Apple Menu (Mac OS Only)

About Quick Pallet Maker: Opens a window with general information of the product and company that produces it. It also contains the user's registration information in case that it has been registered successfully.
Register: If this menu is active, then the user can enter his/her registration information in the window that is opened with this command.
Buy QPM: Starts an web-based process to purchase QPM licenses. An internet connection is required.
Preferences (Mac OSX only): Displays the Preferences window.

File Menu

New Data Sheet… …Start from PP: This command will open a new document window starting from the primary package dimensions.
New Data Sheet… …Start from Box: This will open a new document window starting from box dimensions.
Load Input Data: Will prompt the user through a window to locate an input data file in order to fill the Input Window starting from PP with saved information.
Save Input Data: Shows a window from which the user can pick the location and name of a file that will contain all the information that is currently on the Input Window.
Save as: Saves the input data with a different name or location as the current.
Load Solutions: This works only within the Results Window and will prompt the user to locate a folder from which he/she can load a set of pallets onto the list on the lower section of the said window. Note that QPM will look for pallet files within a folder and load ALL of them, while ignoring other files.
Save Solutions: When this command is selected, QPM will show a window where the user defines the folder that will contain all the pallet files that were selected. The saved files can then be opened individually through the "Open Report" command or in a group through the "Load Solutions".
Open Report: Shows a window from which the user can select an individual pallet file for loading. Only works from the Input, Results or the Detailed Report window.
Save Report: Will open a window where the user can pick the name and location of the file that will contain the data relevant to the resulting pallet. This works only from the Detailed Report window.
Export Report… …Graphics: Copies the graphics that are on the first tab of the Detailed Report and saves the output as a graphics file. If the user has installed QuickTime (free from Apple), then he/she will be able to save the files in other formats different than PICT (Mac OS) or BMP (Windows).
Export Report… Text: Will copy the relevant pallet information and save it into a text file.
Export Report… MS Excel: Creates a tab-delimited Microsoft Excel that can be opened directly by that application.
Export Report… Palletizing Movie: Creates a QuickTime Movie File (QT required, free from Apple) that contains the step-by-step pallet assembly sequence in a computer animation.
Export Report… Box Coordinates: Creates a comma-delimited file with the coordinates and orientation of all the boxes in the pallet.
Quit: Quits QPM.
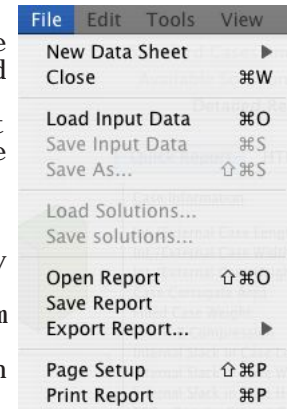
Quick Pallet Maker Menus

Edit Menu:

Undo: Only works in the Layer Editor window. Will relocate the selected box to its original position and orientation.
Cut: Does nothing.
Copy: Use this command to copy the output from the pallet list onto another application. Can be done only from the results window.
Copy Report: Use this command to copy the report graphics onto another application.
Paste: Pastes text in selected text boxes or graphics onto the graphics section of the first tab of the Detailed Report window.
Duplicate: This command is used to add more cases or pallets to the standard case and pallets window and to duplicate pallet solutions in the bottom list of the output window.
Text Font: From all views except the HTML report view, this command will change the application font.
Text Size: Changes the size of the text that has been selected in the text box of the HTML report view.

Tools menu:

Recalculate: Calculates solutions based on the available input data. If starting from any of the Input Windows, will display the Results Window if a solution was found. If used from the Results window, will calculate pallets from the selected box.
Change Data: Goes back to the previous window. If used from the Detailed Report, will return to the Results Window. If used from the Results Window, will return to the Input Window.
Advanced Input Data: Displays the Advanced Input Window where the user can select an input range to seek an optimal solution.
Load Multiple Packages: When on the Input Window starting from PP, will open the Multiple Packages Window.
Fill Container: Opens the container fill window when selecting a pallet solution in the Results Window.
Layer Editor: Opens the Layer Editor window when selecting a pallet solution in the Results Window.
Pallet Actions… Optimize: When chosen from the Results Window, will run the selected pallet through an optimization algorithm that tries to include more boxes per layer. If it can't come up with a pallet that has more boxes, QPM will produce an appropriate message.
Pallet Actions… Optimize and flip cases: When chosen from the results window, this command will try to optimize the pallets further by turning the boxes on their sides and optimizing the layers.
Pallet Actions… Mix Layers and optimize in height: This command allows the user to select up to three layers for QPM to create a mixed pallet with enough layers of each one of the boxes to include as many of them as possible per pallet.
Pallet Actions… Alternate layers: Flips the layers in the selected pallets to gain more stability in the load. Note that this also reduces the box strength.
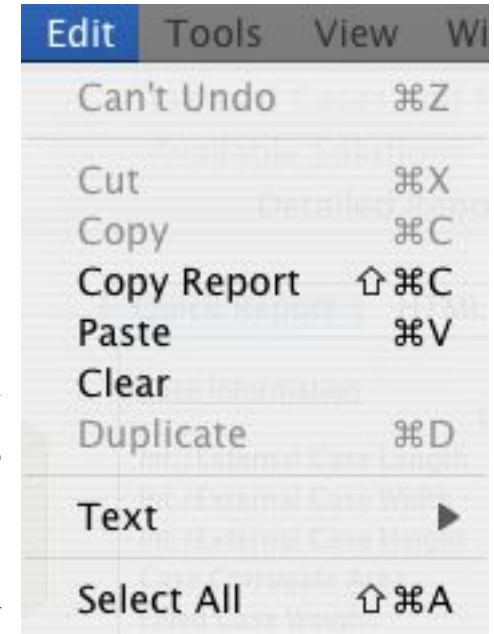
Quick Pallet Maker Menus

Tools Menu (continued)

Pallet Actions… Mix pallet: When the user selects a number of pallets in the list at the bottom of the Results window, this command will create a pallet that contains the first layer of each one of the selected pallets in the order that they were selected.

Pallet Actions… Display Box Length: Creates a display or pinwheel pallet arrangement that tries to show as much as possible the longest side of the box to the external section of the pallet.

Pallet Actions… Display Box Width: Creates a display or pinwheel pallet arrangement that tries to show as much as possible the shortest side of the box to the external section of the pallet.

will delete all the pallets in the list and duplicate the selected pallet until the number of primary packages has been met. If a partial pallet is required, then the last one of the list will contain an incomplete number of boxes. Will not work if the user had not previously specified the number of primary packages in the shipment through the Multiple Package window.

Power Sort: From the Results window, will open a small window from which the user can determine the criteria for ordering the pallets in the list.

Box Compression: Opens the case compression calculation window. If this window has not been open, the detailed report will show "TBD" instead of a real case compression value.

Units… mm/kg: Changes the work units to millimeters and kilograms.

Units… in/lbs: Changes the work units to inches and pounds.

Units… cm/kg: Changes the work units to centimeters and kilograms.

Round numbers: If this item is selected, QPM will show the length units without decimals.

Preferences (Windows OS and Mac Classic): Will open the Settings window.

View Menu

Color: Adds color to all the QPM graphics.

Black and White: Changes all the QPM graphics to B&W. This is useful for printing on a black & white printer.

Internal Box View: Will only work within the Results window. Changes the box view to show only the contents. If the box is empty, then will show an empty frame.
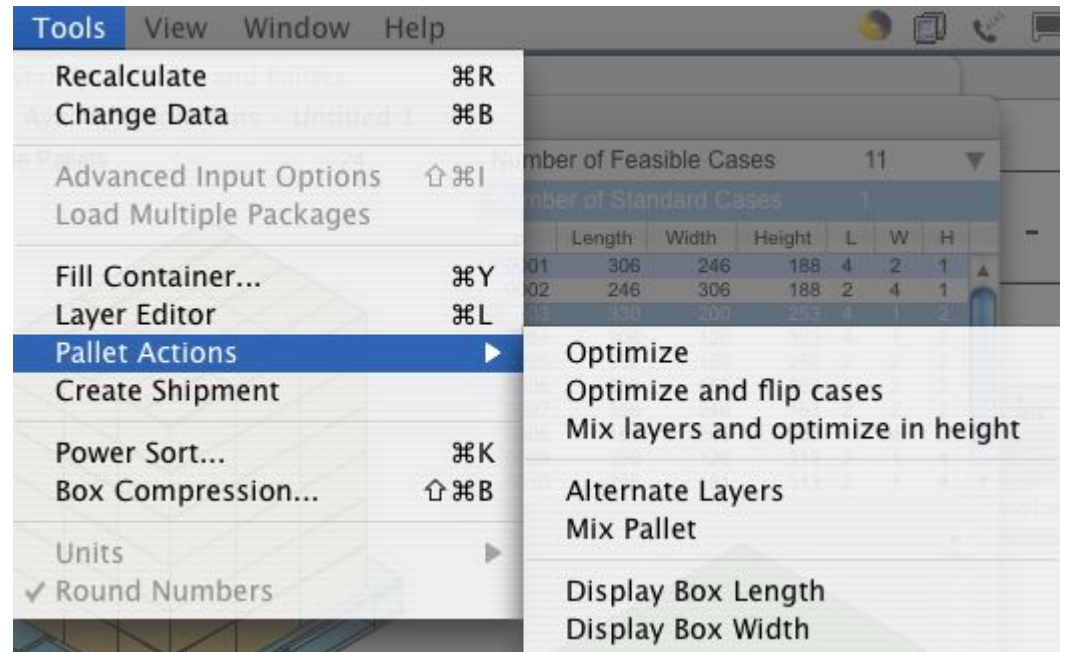
Quick Pallet Maker Menus

View Menu (continued)

External Box View: Only works from the Results window. Will show a closed box and a full tray where applicable.
Open Box/Empty Tray: Will show the empty box or the empty tray when selected, depending on which type of secondary packaging is being used.
View box contents: This command removes the frontal side and flaps from the box to show the contents while keeping the back of the box for reference.
Spread primary packages: If this option is selected (as in the default option), then the primary packages of different layers will separate as they move upwards with the slider at the right of the box drawing. Otherwise, the packages will move together as a block.
One Pallet layer: This command will show only the first layer of the pallet load.
All Pallet layers: This command will show all the layers of the pallet load.
Show corner posts: Will display the corner posts in the pallet drawing.
Show top cap: Places a corrugate sheet on top of the pallet load.
Show layer pads: Places corrugate sheets between the layers of the pallet.
Show box tape: Displays the tape that is used for covering the RSC boxes. This is useful when flipping boxes to see which side is which.
Empty tray: Shows empty trays in the pallet load. This feature is useful to obtain a better idea of how the trays are located on a pallet.
Toggle pallet view: Changes the view of the pallet. The views are top, side, front as isometric.

Window menu:

Detailed Report: Will show the Detailed Report if the Results window is visible.
Standard cases and pallets: Shows the standard cases, pallets and containers window. Most of the time this window will already be in the background. If so, this command will bring it to the front.
Document window selector: This command (default value = untitled) will show the appropriate document window. This is especially useful if many windows have been opened.

Help Menu:

Quick Pallet Maker Help: Opens the HTML-based help. Will run on the default browser for Windows and in Help viewer (Mac OS).
Software Forum: Opens the web page in which the user can ask questions or look at others that have already been answered.
Quick Poll: Opens a web page in which the user can answer a quick poll regarding his/her experience with QPM.
Register (Windows): If this menu is active, then the user can enter his/her registration information in the window that is opened with this command.
Buy QPM (Windows): Starts an web-based process to purchase QPM licenses. An internet connection is required.
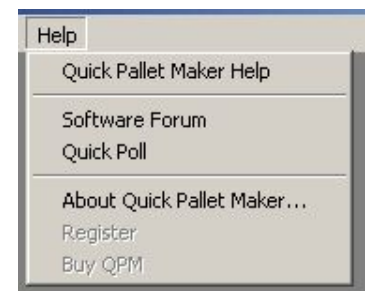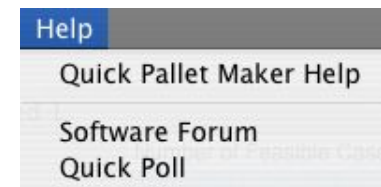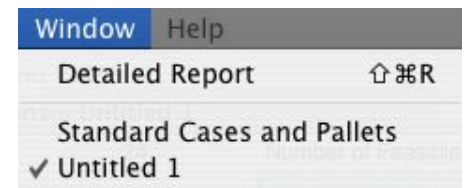
Quick Pallet Maker Windows - Input Window (start from PP)

Primary Package Information:

• Package Shape: Pick from rectangular, cylindrical or bottle depending on whether your PP looks more like a can, a box or a bottle, respectively. Drag on the bottle drawing to adjust the shape.
• Dimensions allowed vertical to pallet: If you check all of these, then your PP can be placed in every position within the box. Uncheck some elements if you wish to constrain your PP to some positions. Bottles can only be calculated upright. If you wish to work with bottles laying down, select cylinders instead.
• Weight: Primary package gross weight.
• External dimensions: Insert the external dimensions of the PP that you are considering. If you wish to find the best solution or test different options, pick the Advanced Input option from the Tools menu.

Case Properties:

• Case count: Insert the number of primary packages per case. Again, if this is undefined, choose the Advanced Input option.
• Bulge factor: Type the expected horizontal box increment (if any). This will expand the size of the resulting case by the specified percentage.
• Flute type pull-down menu: Use this menu if you know the board grade for your boxes. If not, type in the additional space that each box takes in the adjacent spaces; length, width and height, respectively.
• Construction type: Pick a Regular Slotted Container, a tray or stretch-wrap from this menu. Again, if you wish to type in the data directly, it will override this pull-down menu.
• Include partitions: Click here if you wish to add standard internal partitions to your box.
• Maximum and minimum case length, width and height: If this is not a concern, pick low values for the minimum and high values for the maximum. The purpose of these restrictions is to avoid creating boxes that are too small or too large.
• Maximum and minimum case dimensional ratios: The purpose of these restrictions is to avoid creating awkward boxes (too long, too narrow or too flat). This option allows you to pick ratios between the external case dimensions. If this is not a concern, pick low values for the minimum and high values for the maximum. Most calculation errors in QPM occur from a wrong selection of these values.

Quick Pallet Maker Windows - Input Window (start from PP)

Standard cases:

Select the appropriate option if you wish to round the case dimensions to Metric or Imperial unit standard cases. A minimum and maximum in-case slack must be set (compression is acceptable but not recommended). The following options are feasible for standard case sizes:
a) Do not use standard cases.
b) Use standard cases if possible: this option will keep the calculated box dimensions if no standard cases are feasible.
c) Use only standard cases: when selected, QPM will show a "no solutions" notice if standard cases are not found.
d) Fill boxes: This option finds the optimal PP counts and orientations for a given box size.
e) Fill boxes with constant case count: reorients the boxes in irregular orientations in order to use standard boxes.
The other standard case input items are the following:
• Standard case type: Allows the user to classify the standard cases and use some types independently of others (e.g. strong vs. weak cases or RSC cases vs. trays).
• Maximum slack in case: Adjust these values to obtain cases with different slack levels. Too little slack will constrain the number of solutions. Too much slack will create inefficient and non-protective boxes.
• Maximum compression in case: Few products can be compressed, so we recommend using with caution.

Pallet dimensions:

• Type menu: Pick a standard shipping pallet from this pull-down menu. The pallet types can be edited in the Standard Cases and Pallets window.
• Dimensions: You may override the previous menu by introducing the length, width and height values at the right of the menu. The pallet height is for the empty shipping pallet, not the load. To ship without a pallet, type zero for all the values.
• Pallet weight: Type the shipping pallet weight.

Load properties:

• Minimum load dimensions: Type the length, width and height for the load you wish to obtain. If not a constraint, type a low value.
• Maximum load dimensions and weight: For this input, length and width should be equal to the shipping pallet dimensions unless overhang is added deliberately. Maximum load height includes the shipping pallet. If packing boxes directly into a container, the user can replace the pallet dimensions with the internal dimensions of the container.

Quick Pallet Maker Windows - Input Window (start from box dimensions)

Alternate Input window – Start from box dimensions

This window was added to QPM to save time for those users that already know the box dimensions and want to calculate the pallet arrangements only. Note that different box sizes can be added to the list and calculated simultaneously. The case and pallet information is filled in the same way as in the input window explained previously, with the only exception that the case constraints and case count are not needed here. The added boxes (although empty) are assigned a weight which is useful for loading pallets, trucks and containers. The box drawings for an added box will show an empty box, so if the user chooses to draw the contents only, a light frame will appear. The user can import a box that was exported previously from a previous list of solutions. Resulting boxes (not trays) can be placed on their side in the pallet by checking "length" and "width" in "Dimensions allowed vertical to pallet". We don't recommend stacking the boxes in positions other than the one that they were designed for because it reduces the compression strength. All available standard pallets can be tested quickly by checking the "Try all pallets" option.

Quick Pallet Maker Windows - Advanced Input

Advanced input:

This window was designed to calculate the best solutions by varying the selected input variable. This will override the normal solution calculation process and return a range of solutions for a data range or return the best solution for a given data set. The selection criteria of the solution can be changed.
• Vary: Pick the variable that you wish to work with to produce different solutions.
• Between: Choose the lower and superior limits for the variable that you have chosen.
• Achieve a value: Select the criteria that match the type of results that you wish to obtain.
• Value: Can be a minimum, maximum, range or exact value, depending on the selected criterion.
• For: Select the target variable that will be benchmarked.
• Constant volume: Check this box if you wish your primary package maintains its volume constant while iterating. This is especially useful for products that are sold by weight or volume (grains, liquids, etc.).
• Show all results or only show best result: Push either button to obtain only the best solution given the input criteria or a range of solutions that satisfy the criteria.

Vary [Case Count]

between [0] and [24] Units

to achieve a value [as high as possible]

for

[Primary Packages/Pallet]

Step 1 Units Number of Iterations 24

⦿ Show All Results ○ Only Show Best Result

(Cancel) (OK)

Quick Pallet Maker Windows

Multiple primary package input window.

This window contains all of the elements of the primary package section of the input window, besides the following:
• Number of packages: The user will enter a number of primary packages for creating a shipment here. If zero is left, then QPM will not consider this PP for the shipment feature.
• Add package: This button adds a package to the list, based on the data that has been introduced.
• Edit package: If the user selects a package from the list, this command will replace the selected package with the data that has been introduced.
• Import package: This button allows the user to import a primary package from a file.
• Export package: This button allows the user to export a primary package to a file.
• Package list: This table shows the characteristics of each package.
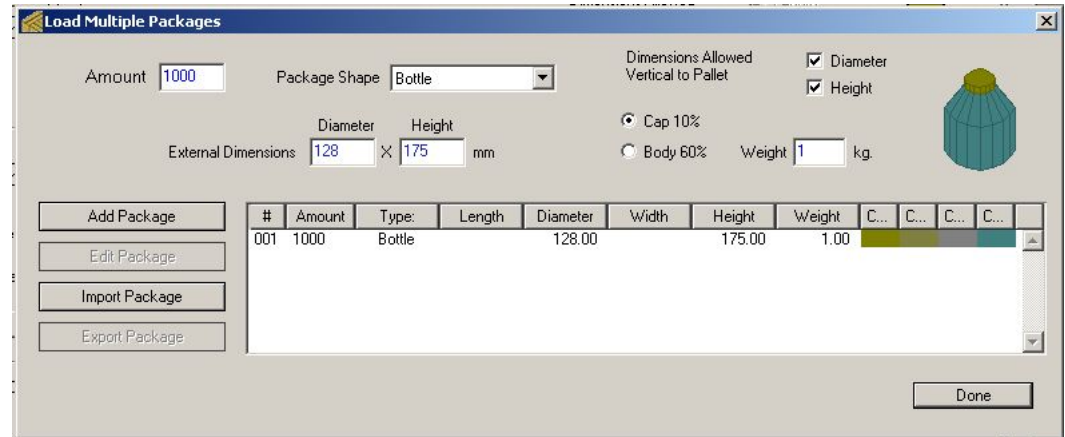
Output Window

Box Section:
Pick the internal or external case view options and any of the feasible cases, given the input data.
• The table above the box drawing presents the following information:
o N: indicates the solution number,
o Length: case external length
o Width: case external width
o Height: case external height
o Weight: case gross weight
o L: primary packages per case length
o W: primary packages per case width
o H: primary packages per case height
• Click on picture: clicking with the right mouse button (ctrl+click on a Mac) will open a contextual menu that allows the following options:
o Copy: copies the box drawing onto the clipboard for use in other applications.
o Internal view: Views the box contents (i.e. the primary packages). If the box is empty, will show a light-colored frame.

Quick Pallet Maker Windows

Results Window (continued)

o External View: Shows a full box or a full tray, depending on the case.
o Empty tray or Open Box: Shows the empty tray or an open box. The latter is especially useful when viewing the internal slack per case.
o View Box Contents: Exploded box view.
o Import Box: Opens a file that contains information for a saved box. Save and reuse boxes when you consider that they will be applied to different pallet configurations and/or load restrictions.
o Export Box: Saves the selected box to a file.
• Primary package slider: The box drawing contains a slider at the right that shifts the primary packages up and down. If the user has checked the "Spread Primary Packages" command in the View menu, then the packages will separate as they rise above the box. Otherwise, they will rise together from the box.
• Enlarge boxes: Add slack to the cases in order to round the dimensions, to increase box stability or to reduce the risks of box manufacturing fluctuations.

Pallet Results Section

This section displays all the solutions that were found using the input data (taking into account the constraints that were established). The following can be done from this section:
• View different pallet solutions by clicking on the solution line or by moving with the up and down arrows. The pallet drawing and the box drawing will immediately update to reflect the pallet that is being chosen.
• Duplicate a pallet. Select a pallet and then select "Duplicate" from the Edit menu. A new identical pallet will appear.
• Delete a pallet. Select a pallet and press "Delete" (Mac), "Backspace" (PC) or "Del" (both) to delete a pallet solution from the pallet. This is especially useful to eliminate clutter.
• Sort the results by using the Power Sort command from the Tools menus. This will open a window where the user can select two different criteria for sorting.

Quick Pallet Maker Windows

Action Menu:
The results window presents a menu with actions that can be executed with the selected pallet. Whenever the user chooses "Recalculate" from the Input Windows, QPM automatically calculates three different pallet types for each box. However, the application allows more pallet types by using the Action menu. Once you select the option, you will need to enter "Return" These options are:

• Optimize: When chosen from the Results Window, will run the selected pallet through an optimization algorithm that tries to include more boxes per layer. If it can't come up with a pallet that has more boxes, QPM will produce an appropriate message.

• Optimize and flip cases: When chosen from the results window, this command will try to optimize the pallets further by turning the boxes on their sides and optimizing the layers.

• Mix Layers and optimize in height: This command allows the user to select up to three layers for QPM to create a mixed pallet with enough layers of each one of the boxes to include as many of them as possible per pallet.

• Alternate layers: Flips the layers in the selected pallets to gain more stability in the load. Note that this also reduces the box strength.

• Mix pallet: When the user selects a number of pallets in the list at the bottom of the Results window, this command will create a pallet that contains the first layer of each one of the selected pallets in the order that they were selected.

• Display Box Length: Creates a display or pinwheel pallet arrangement that tries to show as much as possible the longest side of the box to the external section of the pallet.

• Display Box Width: Creates a display or pinwheel pallet arrangement that tries to show as much as possible the shortest side of the box to the external section of the pallet.
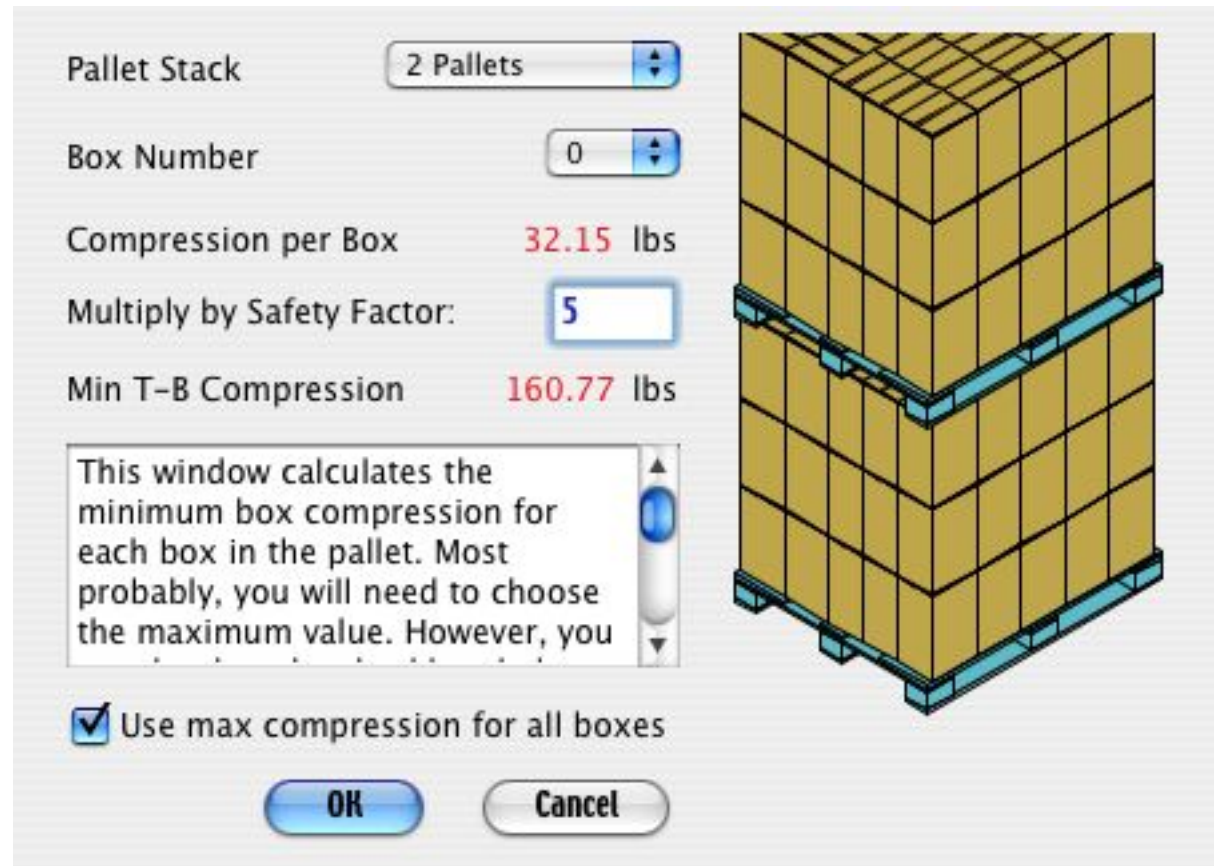
Quick Pallet Maker Windows - Box Compression Window

Box Compression Window:

This window calculates the minimum top to bottom compression strength that each case must support, given a certain safety factor. This factor can be estimated using corrugate design procedures or the default value may be used. To use this feature:
• Open this window after selecting a solution in the Pallet Results table,
• Indicate how many pallets will be stacked on top of each other.
• Introduce a safety factor. Please ask your corrugate container supplier on which value to apply.

The minimum top to bottom compression is displayed for the pallet arrangement. A checkbox can be used to apply the maximum value to all the boxes, independently of the stress that each box INDIVIDUALLY should support or use independent values per box. The latter is useful in case the user has an inventory of boxes and could use the stronger ones for the bottom rows of the pallet.

Pallet Stack	2 Pallets
Box Number	0
Compression per Box	32.15 lbs
Multiply by Safety Factor:	5
Min T-B Compression	160.77 lbs

This window calculates the minimum box compression for each box in the pallet. Most probably, you will need to choose the maximum value. However, you

☑ Use max compression for all boxes

OK   Cancel

Quick Pallet Maker Windows - Container Fill Window

Container Fill Window:

This window was designed to help the user create pallet arrangements within containers for shipping either unlimited pallet amounts or a finite number of pallets within a container. The window is activated through the appropriate menu command in the Tools menu and contains two tabs, one for input and the other for output.

Input Tab:
• Pallet dimensions: In these text boxes, the user will enter the external pallet dimensions in case he/she wishes to create a pallet from scratch. Length, width, height and weight can be entered here.
• Number of pallets: This value represents the number of pallets that will be added with the "Add Pallet" button. This is useful for calculating container loads with a finite number of pallets.
• Pallet list: Contains all the pallets that can be used for filling. Note that if only one pallet is selected, then QPM will calculate how many of that pallet type fit into the container. If more than one is selected, then QPM will fill the container taking into account the order of those pallets.
• Add Pallet button: Adds a pallet based on the information at left of the table. The drawing of that pallet will show a big load-sized block with the same color as the user's boxes on top of a four-way pallet.
• Import pallet: Allows the user to select a previously saved report and import it for calculating pallet loads.
• Pallet drawing: Shows the pallet.
• Container type: This pull-down menu provides the user the means to select which standard container type will be used for filling. This list is taken from the standard cases, pallets and containers window and currently (version 3.2) cannot be modified. However, the container load restrictions can be modified in the section below.
• Container dimensions (load constraints): The values in this section represent the internal container dimensions. The pallets within the container cannot exceed the set dimensions. Note that when a finite number of pallets are placed into a container (by selecting more than one from the list), the minimum load dimensions must be made smaller or else no solutions will be found.

Output tab:
The second tab contains a large drawing that will show a container only if there is a possible solution. Unlike the pallet calculations, QPM only shows the optimal container solution. There are four types of possible drawings:
• Three-dimensional view of full pallets
• 3D view of empty pallets
• Top view of full pallets
• Top view of empty pallets
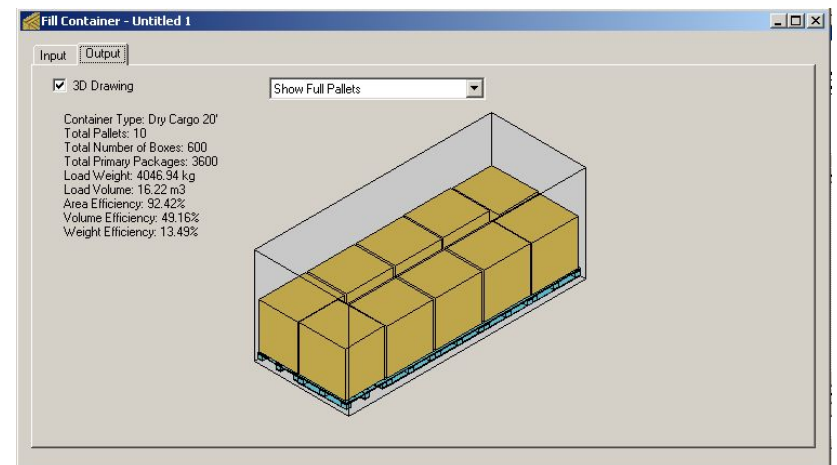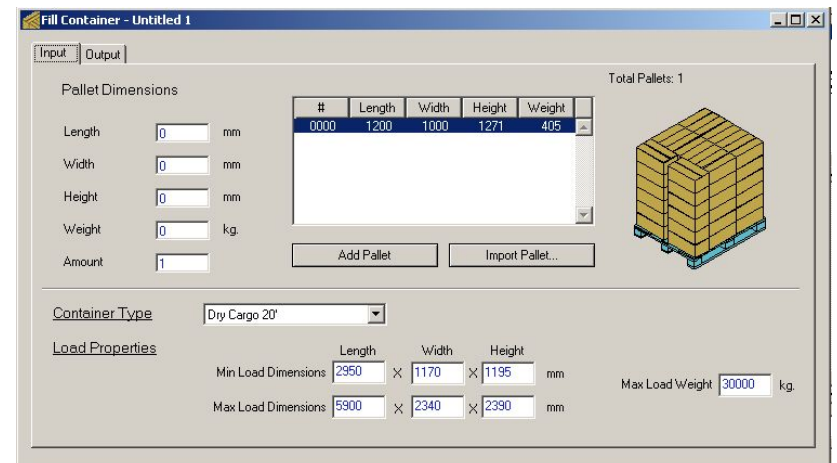
Quick Pallet Maker Windows - Detailed Report Window

Report Window:

This window displays all the solution data and the input data that was used to solve the specific problem. It too contains tabs, four of them. The pages are the following:
• Quick Report: Shows the Primary Package drawing and data (if it exists), the box drawing and data and the pallet drawing and data. The user can select a different box with the slider below the drawing. A text box allows the user to calculate the statistical units per pallet by entering the SU value. Another text box can be used for entering commentaries for printing or saving. If the user enters text in this box and then switches to the second tab, it will be recorded in the HTML report. Before printing the Quick Report, select "Page Setup" and set the page orientation to Landscape.
• HTML report: This tab contains a text editor that contains the HTML version of the quick report and a set of drawings that can be selected for inclusion in the HTML export. When the user has set the appropriate drawings, he/she must select the "Preview in Browser" command from the File menu to view and later print the report. The HTML report opens up a new path for customizable reports that require a minimum knowledge of HTML.
• Pallet views: This tab contains pallet drawings that can be exported or printed. If the user chooses "Toggle Pallet View" from the View menu, he/she can export or print larger pallet drawings than otherwise possible.
• KDF view: The last tab shows the blueprints of the selected box with dimensions. This is useful for submitting to the case manufacturer.

Quick Pallet Maker Windows - Standard Cases, Pallets and Containers Window

Standard Cases, Pallets and Containers window:

As mentioned earlier, the user can pick to convert calculated box dimensions to standard box dimensions automatically. The user sets an appropriate amount of internal case slack and/or compression. The list of cases that are available can be edited through the standard cases and pallets window.