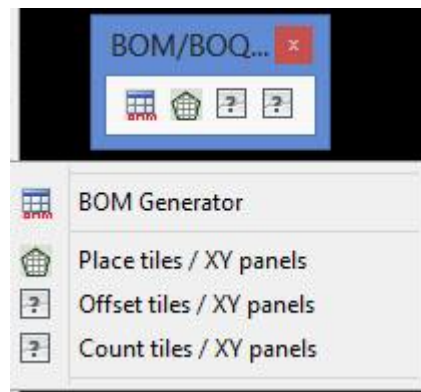


## BOM / BOQ Tools in CADPower – for AutoCAD & BricsCAD

### The Bill of Materials / Quantities Tools in CADPower V17

CADPower V17 has a comprehensive tool for Bill of Materials / Bill of Quantities tool that supports several different workflows.



[CP\\_BOM](#) is the name of the command in CADPower and it is accessible from the CADPower main pull-down menu under the **BOM/BOQ Tools**. There is also a separate toolbar for the same.

The BOM/BOQ tool offers the following functions:

- Produce a quantity and cost summary of multiple blocks in the drawing, report as DWG table data (with optional spread-sheet export / import).
- Tabulate, summarize and report block attributes in a DWG table that can also be exported to a spreadsheet (like Excel / Libre Office).
- Edit attribute data in a spreadsheet interface and bring them back into CAD, updating both the DWG table as well as block attributes (Round-tripping of attribute data).
- Use block scale factors as defining tile (or planar elements) data and produce a report of quantity, area, cost (with optional spread-sheet export / import).
- Produce a Indexed BOM that collects defined index points in the drawing and tabulates them into a legend-like entry.
- Dynamic Blocks : This workflow supports dynamic blocks that are defined with a visibility parameter, counts them and reports a table of block names against their Visibility status. Excel export/import is possible here as well.
- Linear Quantities calculation tool: If your drawing includes linear elements like cables, rebars, pipes, ducts, wires etc. which are represented a lines, polylines,

arcs, splines and quantified with cost/m and weight/m parameters, the linear quantities BOQ is for you. This is enabled by the CP\_LINEQTY command.

The BOM tool is fully parametric. All user settings can be saved to INI files and restored during the next CAD session. The INI file can be easily edited using a dedicated INI Editor which is part of the tool. CAD managers can use this feature to setup the BOM presentation format and deploy the same standard across all computers.

### **Workflow 1: Producing a quantity & cost estimate by counting blocks.**

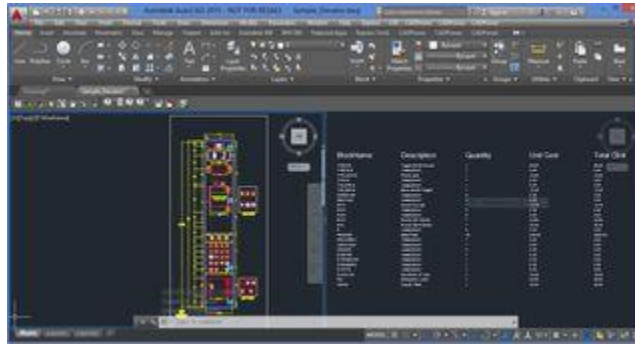


Image courtesy: Actual CADPower user using AutoCAD 2015

[Download Sample Elevator.ZIP](#) The sample Elevator.DWG and Elevator.INI file shown in this zip is an illustration of how you can create a bill of quantities and cost estimate table out of a number of different blocks from your drawing. This is a powerful block summary extractor which can also be exported to Excel.

### **Workflow 2: Producing a tabulated listing of attributes, and edit in Excel.**

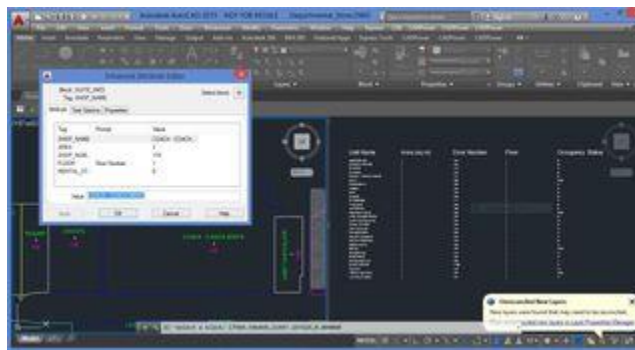


Image courtesy: Actual CADPower user using AutoCAD 2015

[Download Sample Departmental\\_Store.ZIP](#) This sample Departmental\_Store.dwg and Departmental\_Store.ini shows you how you can create a tabulated extract of block attributes, export the same into Excel, do some editing there and bring it back into CAD in a 100% round-trip conversion.

### **Workflow 3: Produce a quantity and cost estimate of blocks based on scale factors.**

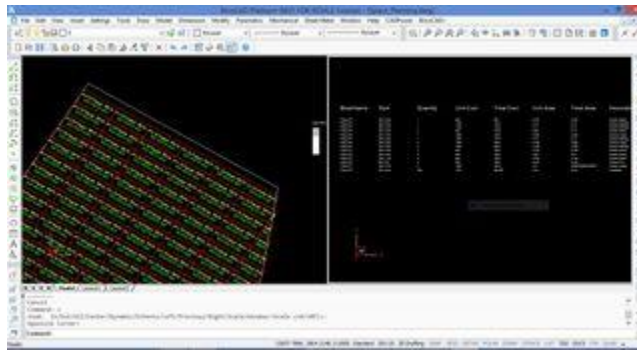


Image courtesy: CADPower running under BricsCAD

[Download Space Planning.ZIP](#) This sample **Space\_Planning.DWG** and **Space\_Planning.INI** file shows you how can use a tiled block based on scale factors to create a space planning tool.

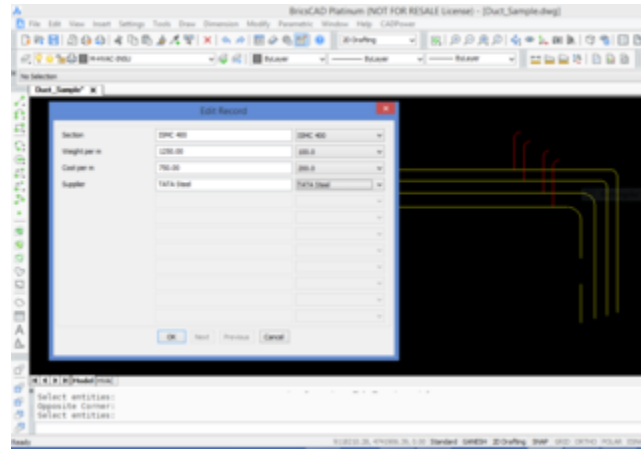
Often, architects and engineers need to full up a space with panels which are easily defined as blocks with X and Y scale factors. You can define a unit block and scale them up to the desired scale and fill up irregular boundary patterns with such panel blocks using the **CP\_TILEPLACE** and **CP\_TILEOFFSET** commands in CADPower (More about these commands in the next post).

The BOM/BOQ tool is available in CADPower since V15 and is accessible from the command line using the **CP\_BOM** command. It is a 4-in-1 BOM/BOQ, Data Extraction, Tabulation and Synchronization tool for the .dwg platform and runs in AutoCAD and BricsCAD (1200% AutoCAD compatible platform).

The BOM tool works mainly on blocks as their source data. Block names, attributes, scale factors and a host of other parameters defined parametrically in INI files are all used together to create meaningful derivate reports, in your drawing, Excel and other flat file formats.

#### **Workflow 4: Tagging data to linear elements and generating linear quantities & cost.**

**The [CP\\_DATAMAN](#) command:** (CADPower -> Build -> Data Manager): The **CP\_DATAMAN** command is used to define a simple XDATA based database which operates entirely inside your CAD drawing. All data is stored in XDATA attached to entities and the database definition is provided in a simple INI file.



A sample structure of the INI file looks like this. Explanation about the syntax is provided after each section.

```
[*RECORD]
Name=BAR_INFO
Type=XDATA
FIELD=Section,String,1000
FIELD=Weight per m,Real,1000.0
FIELD=Cost per m,Real,500.0
FIELD=Supplier,String,Tata
[*RECORD_END]
```

The [\*RECORD]...[\*RECORD\_END] section defines the database structure. It is defined with lines having <Parameter>=<Value> syntax.

The 'Name' parameter specifies the database name (or the XDATA application name).

The 'Type' parameter indicates the type of database. In this case, it is 'XDATA'. In future, additional database types like 'ATTRIBUTES' etc will be introduced.

```
[*FIELD_VALUES]
Name=Section
Values=ISMB 200
Values=ISMB 300
Values=ISMC 400
[*FIELD_VALUES_END]
```

The [\*FIELD\_VALUES]...[\*FIELD\_VALUES\_END] section defines the fields structure. This is also defined with <Parameter>=<Value> syntax.

The 'Name' parameter specifies the Field Name.

The 'Values' parameter defines the commonly used values for the field. These will appear in a pull-down menu when the CP\_DATAMAN command is run.

There will be multiple [\*FIELD\_VALUES] section in the INI file, as many as the number of fields. However, it is not mandatory to define the [\*FIELD\_VALUES]. If this section is not defined for a field, there will be no pull-down menu options while entering data for the field.

When you run the CP\_DATAMAN command, you are asked for a INI file. This file defines the structure of the database. As per this structure, the user can enter data via a dialog box interface. If you are editing existing entity data using this command, the data in the entity must be of the same structure as defined in the INI file, else an error is flagged and the command aborts.

**The CP\_LINEQTY command:** (CADPower -> BOM/BOQ Tools -> Compute linear quantities): In one of my earlier posts, I promised CAD users a tool for computing quantities based on the cost and weight of materials per unit length. In other words, a Bill of Quantities based on the length as the defining parameter.

The CP\_LINEQTY command provides this feature - a quantity summary using physical length, weight/unit length and cost/unit length as the primary parameters.

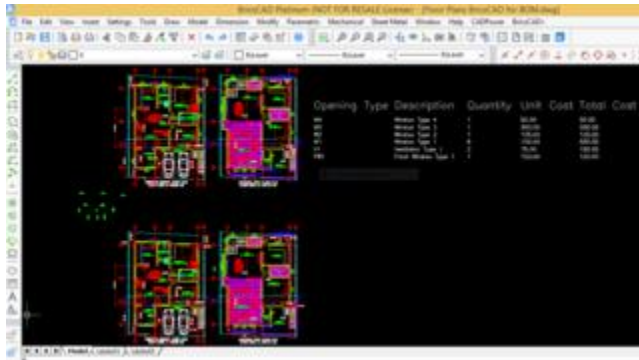
```
Command: CP_LINEQTY
Menu: CADPower -> BOM/BOQ Tools -> Compute linear quantities
Enter data definition INI file name(- for list) <F:\Projects\8801_wpt_new\lineqty.INI>:
Select linear objects for quantity calculation:
Select entities: all
Select entities:
Database structure
-----
Name      Value
-----
Name      Total Weight      Total Cost      Total Length      Number of items
-----
LINE 200  3278238.8         2998432.8         8558.5             4
LINE 300  2835688.8         526181.7          814.8             4
LINE 250  1228851.8         1884888.8         3538.1             5
SPL 000  589848.8         117889.7          294.5             4
LINE 050  1743289.8         987826.5         1291.3            4
LINE 400  132535.9         235619.4          294.5             8
Supplier  Total Weight      Total Cost      Total Length      Number of items
-----
TATA Steel  2835688.8         526181.7          814.8             4
Savvik     1228851.8         1884888.8         3538.1             5
M&and     589848.8         117889.7          294.5             4
Kushan    1743289.8         987826.5         1291.3            4
Indus TMT  88287.9          21387.5           353.4             4
SAL       132535.9         235619.4          294.5             8
Enter quantity export file name(- for list) < >: ?
File: F:\Projects\8801_wpt_new\lineqty.csv created successfully.
Command: |
```

All data required comes from XDATA attached to the entity. The entity can hold additional data also as defined in the INI file, which is created/edited using the CP\_DATAMAN command. The CP\_LINEQTY command requires data to be structured in such a way that the 'Weight per unit length' and 'Cost per unit length' are provided as inputs in the INI file. CADPower V 16.05 provides a sample INI file in the install folder (under the SUPPORT sub-folder) which you can use to attach data using CP\_DATAMAN command and then generate quantities using CP\_LINEQTY command.

### *Enhancements in the BOM/BOQ Tool:*

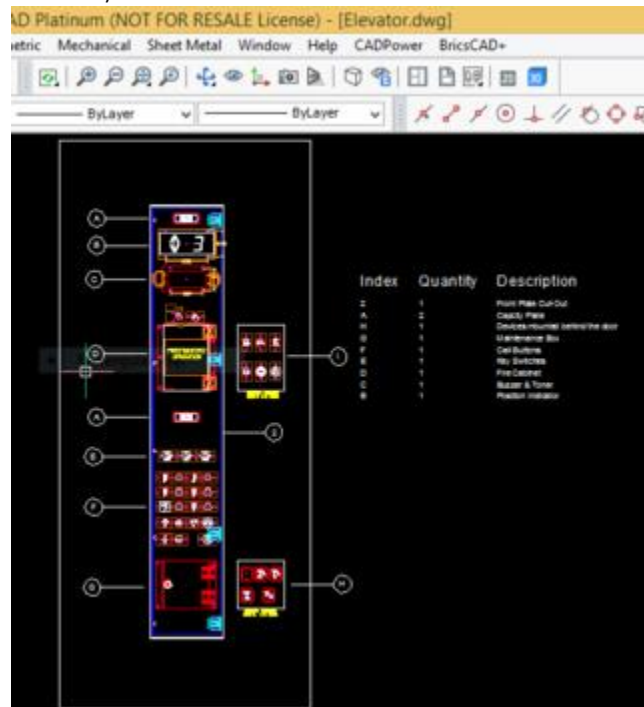
**CP\_BOM ( CADPower -> BOM/BOQ Tools -> Create Bill of Materials/Quantities ):** Significant improvements have been made to the CP\_BOM command.

- It is now possible to import any CSV file directly using CP\_BOM command, not just the ones exported by CP\_BOM. Earlier, this was limited only to 'Attribute Extraction' workflows.
- Two new BOM-types have been introduced. These are called 'Count Attribute Values' and 'IndexedBOM'.
- The 'Count Attribute Values' method allows a bill of quantities to be generated based on the number of times a specific attribute value occurs. Attribute values can be linked to a description and cost which are specified in the INI file.

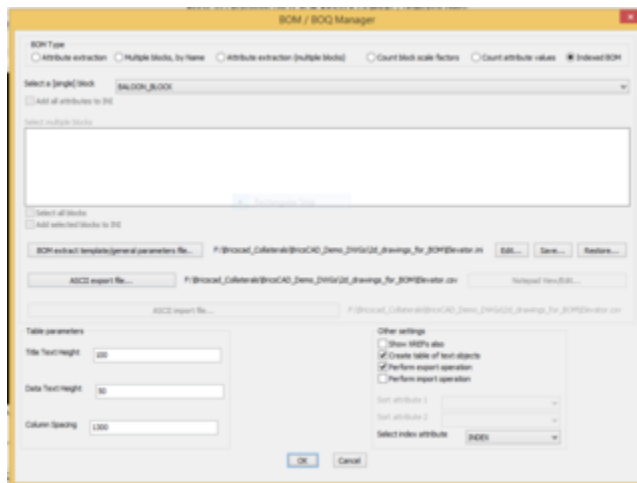


- The 'IndexedBOM' method allows to aggregate, count and report drawing data which are labelled using balloon blocks. A balloon block is a symbol (block with an attribute) created to represent a single part or cluster assembly in the drawing (the references are named A, B, C.... 1, 2, 3.... and so on). For each of these indexes, a description can be specified in the INI file and data can be presented in tabular form. These kinds of drawings are used most often in the process

industry.

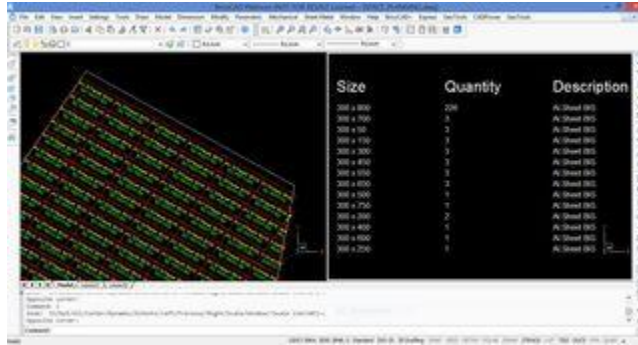


- The CP\_BOM dashboard has been re-designed and the names of the BOM workflows have been changed to better reflect what it does.



- The following are the descriptions:
  - Attribute extraction: Single block name, multiple attributes extraction, tabulation, Excel CSV export/import (round-tripping)
  - Multiple blocks, by Name : Quantity and cost estimation of blocks by name. Creates table in CAD, exports CSV data
  - Attribute extraction (multiple blocks) : Multiple block names with common attributes extraction, tabulation, Excel CSV export/import (round-tripping)

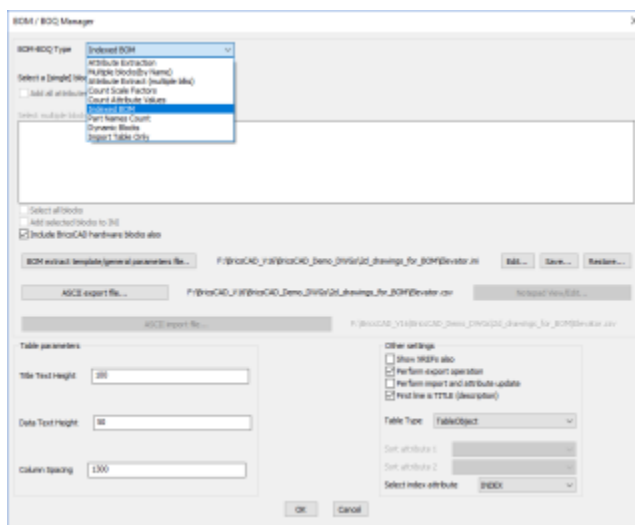
- Count block scale factors : Useful for construction and similar professionals who use a single differently scaled block to cover an area of interest. The BOM is generated based on the count of specific X by Y scale blocks.



- Count attribute values:(described above)
- Indexed BOM: (described above)
- Dynamic Blocks
- Import Table Only

In V 17.14 of CADPower, significant improvements have been made in the Bill-Of-Materials/Quantities tool.

- The various BOM-Q workflow types have now been grouped into a pull-down menu item rather than a radio button. This saves real estate in the dialog box and ensures that the dialog loads even on displays with lower resolution. In addition, we have we have made the UI somewhat compact and readable.

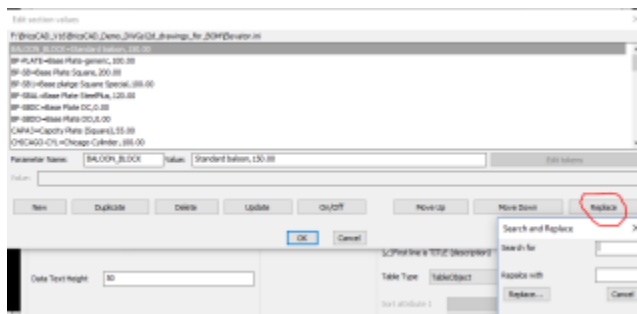




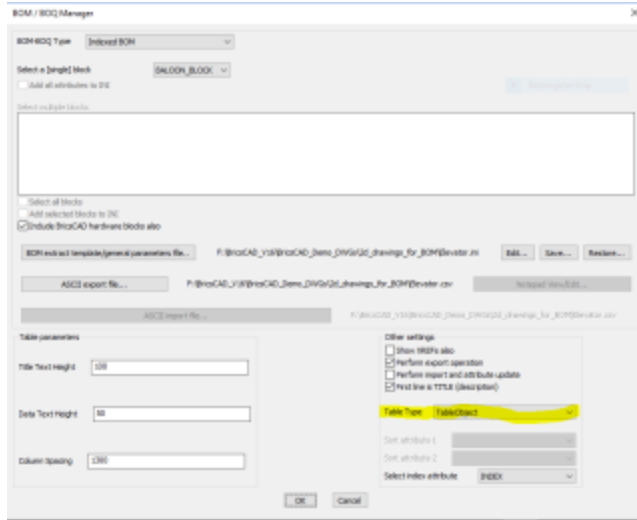
- A new option called 'Dynamic Blocks' has been added. Selecting this option allows you to select dynamic blocks which can be tabulated and counted as per their 'Visibility' states.



- The Import Table option now allows scaling of the imported table.
- In the INI file section editor, a search and replace option has been added. You can use this to quickly change block names or other strings in the current selection.



- A new option has been added to the Output format. You can now create the BOQ table as Text entities or as CAD Table object or simply leave it as None. The None option does only an Excel export and no table is created.



- The 'Import Table Only' option now allows to import CSV files which can be in any un-structured format as far as number of columns are concerned. It need not have the same number of columns in each row. The number of columns in the TABLE adjusts to the highest number of columns in the incoming data.

Call us to know more about Quantity TakeOff tools using CADPower software.

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