Project Management the smart way

Project
Materials
Control

QMS

Materials Management
System for Projects

Track Materials with QMS

QMS

Project Materials Control System

Introducing QMS

In an ideal world, materials control should be easy. Once the design is completed, a bill of materials (BOM) or material take-off (MTO) is generated and issued as a requisition for purchase. Fabrication or installation begins only after all materials have been delivered to site.

Reality is often very different. The above phases overlap and it is common to be installing the first materials before even the design is complete. Managing the intermediate phases of purchasing material progressively while the design is in progress, & controlling sub-contractors when there are material shortages can be complex, time consuming, and off-course be very expensive.

QA Software's Materials Management System QMS is a fully integrated system for managing all phases of the material management process, from Bills of Material through to receipt in store and issues to the field. It is designed to handle large volumes of data and enable the management of change to be carried out quickly and effectively.

Summary

QMS is a complete materials management system for projects. Some of the highlights of the system include:

- By maintaining a complete history of changes to the bill of materials analysis can be performed down to an individual part type of how the quantity required has varied throughout the project life cycle.

- The inquiry and purchase order wizards enable a bill of materials to be summarised in minutes with automatic documentation generation for both bid packages and/or purchase orders.

- If the bill of materials is revised, the effect on current orders can be analysed with just a few key strokes and Purchase order revisions can be issued automatically.

- The purchase order change module keeps a complete history of all changes to purchase orders which, for bulk materials can save large amounts of time in reconciling large and complex orders.

- The delivery wizard makes recording the receipt of materials simple with typing only of the quantities received. Throughout the complete system in-fact, typing is limited essentially to just the stock code library and the Bill of Materials.

- With materials in stock, being able to analyse what can be fabricated or installed can produce significant efficiency gains by being able to accurately schedule work and know that the materials required are available.

- Automatic generation of issue slips/dockets and/or movement dockets saves time and improves accuracy. At all times the exact quantities of material at any location is known.

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Features and Benefits

QMS provides the capacity to:		Which deliver benefits:	
>	Maintain a **Bill of Materials** with full audit trail of all changes.	>	**Reduced disputes** arising from changes to the material requirements as defined by the BOM or MTO.
>	Efficiently generate material **Inquires** and **Purchase Orders** and manage changes quickly.	>	**Increased productivity** for procurement staff and reduced risk of mistakes meaning cost savings.
>	Maintain all **Expediting Events** with full history, including Shipping details.	>	**Reduced risk** of unexpected delays caused by late deliveries.
>	Record **Deliveries to site** and manage returns to vendor.	>	**Increased productivity** in the stores with up to date material information.
>	Analyze **material availability** to identify shortages (current and future) early.	>	**Reduced risk** of delays arising from late material supply**.**
>	Track material **Issues** and **Stock** to ensure up to date material quantities at each location.	>	**Increased productivity** in the stores and reduced risk of financial lost from missing materials.
>	**Integrate** materials tracking back to the Design Model and Accounts systems.	>	**Increased productivity** for material controllers by reducing requirement for double entry of data.

The elements of QMS

The QMS System is made up of a number of elements, each of which addresses a particular area of the materials control process. These are:
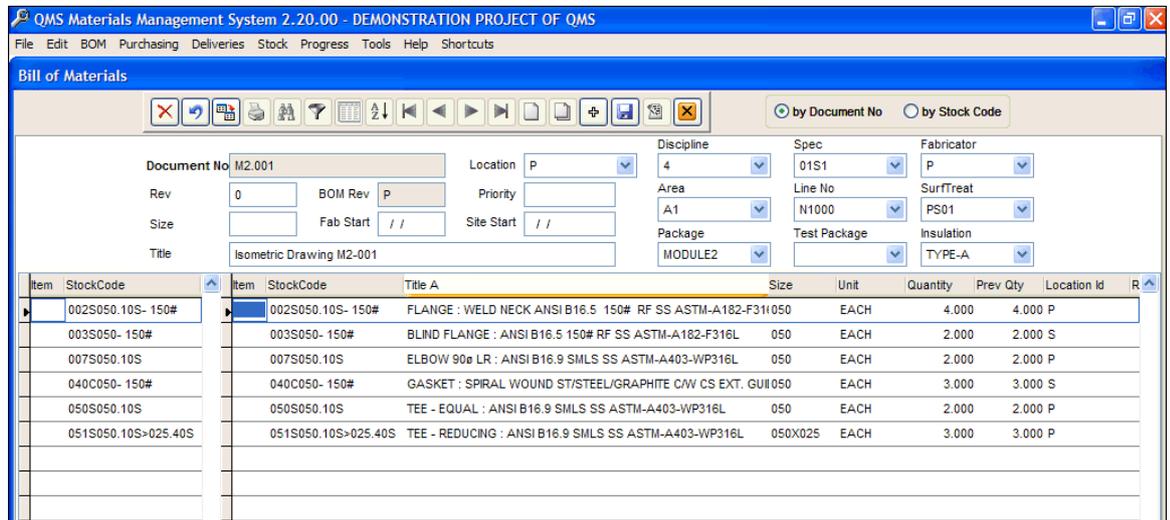
- Stock Code Library
- Bill of Materials
- Inquiries
- Purchase Orders
- Expediting
- Material Deliveries
- Material Movements
- Material Issues
- Materials Availability Analysis
- Stock Control

The Elements of QMS

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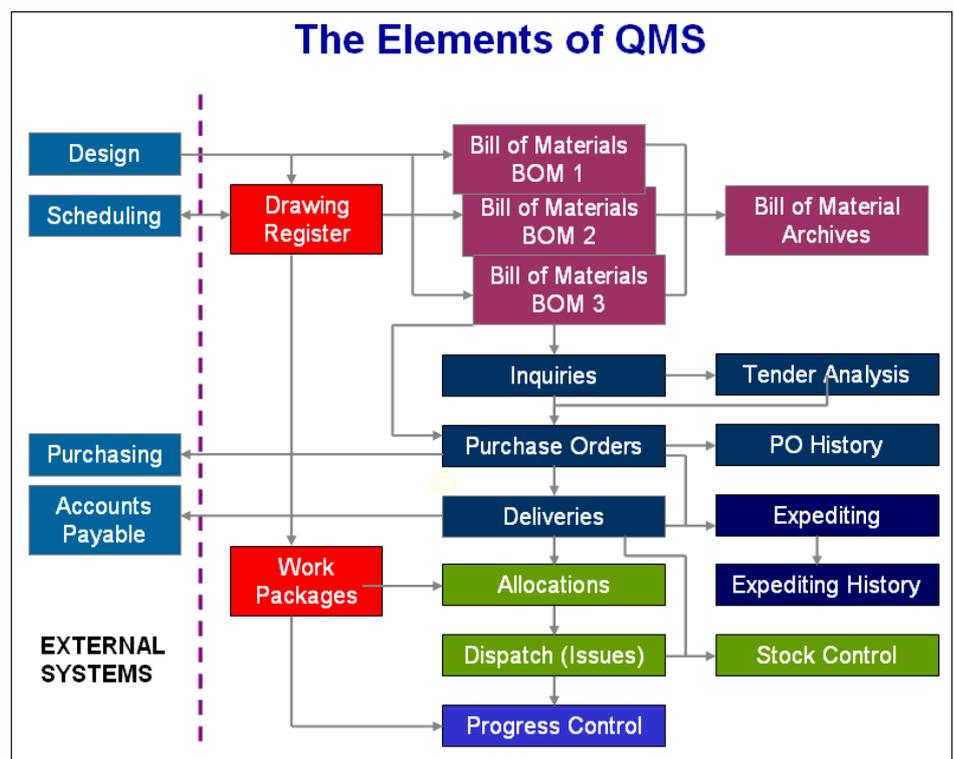
Bill of Materials

A Bill of materials (BOM) defines the material requirement for a project, specified in terms of drawings, stock or component codes, and the quantities of each item required.

A Bill of materials may be generated in total as a single BOM for the complete project, or as a number of smaller BOMs.

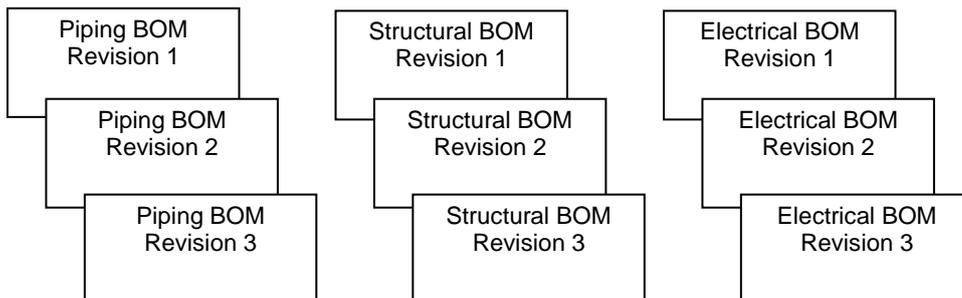| Item	StockCode	Item	StockCode	Title A	Size	Unit	Quantity	Prev Qty	Location Id
	002S050.10S- 150#		002S050.10S- 150#	FLANGE : WELD NECK ANSI B16.5 150# RF SS ASTM-A182-F31	050	EACH	4.000	4.000	P
	003S050- 150#		003S050- 150#	BLIND FLANGE : ANSI B16.5 150# RF SS ASTM-A182-F316L	050	EACH	2.000	2.000	S
	007S050.10S		007S050.10S	ELBOW 90ø LR : ANSI B16.9 SMLS SS ASTM-A403-WP316L	050	EACH	2.000	2.000	P
	040C050- 150#		040C050- 150#	GASKET : SPIRAL WOUND ST/STEEL/GRAPHITE C/W CS EXT. GUI	050	EACH	3.000	3.000	S
	050S050.10S		050S050.10S	TEE - EQUAL : ANSI B16.9 SMLS SS ASTM-A403-WP316L	050	EACH	2.000	2.000	P
	051S050.10S>025.40S		051S050.10S>025.40S	TEE - REDUCING : ANSI B16.9 SMLS SS ASTM-A403-WP316L	050X025	EACH	3.000	3.000	P

A BOM can be entered into QMS manually or, on larger projects, imported electronically. A combination of these two methods may also be used. As the project design and hence the BOM changes, the revised quantities can be recorded in QMS while maintaining a complete audit trail. Hence QMS facilities the management of change to the BOM throughout the project life cycle.

A single BOM typically moves through the following phases:

Estimate → Bulk BOM → Intermediate BOM → Final BOM → Revised Final BOM
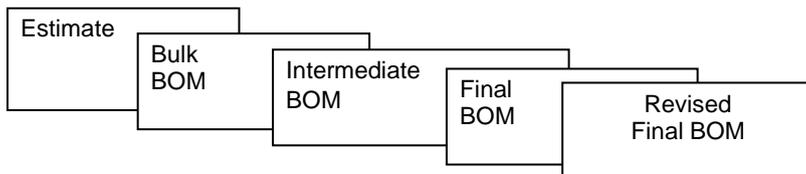
QMS maintains all Bills of Materials, at all revisions, enabling historical analysis of how the BOM changes during the project. Inquiries and Purchase Orders can be generated at any stage from a single BOM or combination of BOMs.

Piping BOM Revision 1 → Piping BOM Revision 2 → Piping BOM Revision 3

Structural BOM Revision 1 → Structural BOM Revision 2 → Structural BOM Revision 3

Electrical BOM Revision 1 → Electrical BOM Revision 2 → Electrical BOM Revision 3

Stock Codes

QMS uses a Stock code library to define a catalogue of stock codes for use on a project. This library is used throughout QMS for validating stock code data entry in the various QMS elements, and for the allocation of stock code descriptions.

Use of a stock code library minimises one of the main sources of errors in the materials control process, the mistyping of stock codes

The Stock code library can be created manually, sourced from another project, or imported electronically from an external application.

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Inquiries

An Inquiry in QMS is a list of materials with required quantities and, is prepared for the purpose of obtaining prices and delivery dates from one or more suppliers. Purchase orders are normally then placed with the supplier offering the best price/delivery combination although, in QMS purchase orders can be created without the need to generate an inquiry if required.

Inquiries can be generated by manually entering the material required or, automatically from the Bill of Materials. The facility to automatically generate inquiries is one of the major benefits of using QMS.

When automatically generating inquiries, the following options are available:

- Select from one or more Bills of Material for calculation of the quantities required.
- Filter on specific material types, stock type, or even on a phrase in the stock code description to generate inquiries for a particular range of materials.
- Deduct quantities already out on inquiry or already purchased when calculating outstanding quantities required.
- Add a percentage mark-up during the calculation process.
- Use rounding for material supplied in fixed quantities.

The facility to automatically generate inquiries saves time and reduces errors, and a complete audit trail on all inquiries generated is maintained by the system.

Purchase Orders

A Purchase Order in QMS is a list of material requirements sourced from a vendor and defines the quantities required, unit rates, delivery dates, and order value.

Once an order is placed, QMS facilitates the expediting of material on order via an expediting module. As material on a purchase order is delivered, the details are recorded, enabling analysis of outstanding and over supplied material as well as reconciliation for accounting purposes.

Purchase orders in QMS can be generated in three different ways:

- They can be generated manually in the Purchase order module
- They can be generated automatically from an Inquiry
- The can be generated automatically direct from the Bills of Materials

All purchase orders in QMS, regardless of how they were generated, must first be prepared as a "draft". While an order remains in draft mode it can be edited and modified as required. Once the order is ready for issue, it is "finalized", at which point it can no longer be edited. Further changes are then made by formally revising the order. A full audit trail is provided to enable historical analysis of changes to orders.

When generating an order automatically from an inquiry, QMS provides the facility to split inquiries across a number of orders. Rates and final quantities can be adjusted and additional line items added which may not have been included in the inquiry.

When generating an order automatically direct from the Bill of Materials, the same options are provided as with the automatic generation of inquiries.

Expediting

Expediting is the important function of monitoring the status of manufacture in relation to purchase orders, to ensure materials are supplied in accordance with the delivery dates specified.
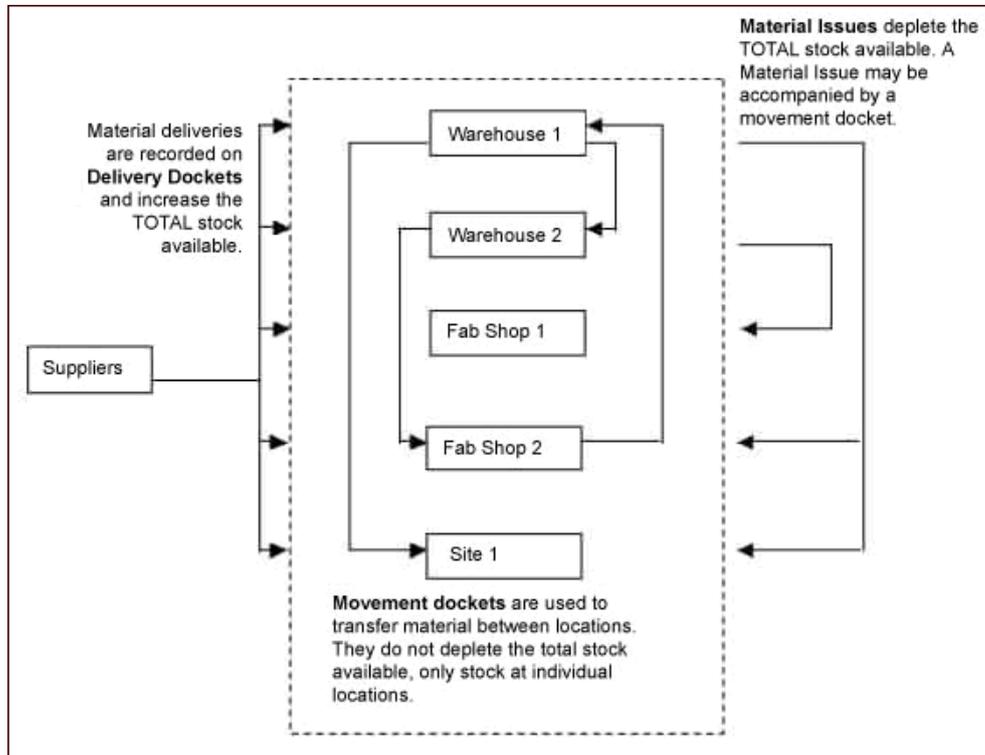
QMS includes a powerful expediting module to maintain a complete history of expediting activity. Reporting by exception means that high priority or potential problem areas get the greatest attention, and that expediting becomes a routine process.

Expediting information can be recorded at both a summary level, in relation to a Purchase Order in general, or at a line item level of detail. The history of previous contacts is maintained at both levels.

Typical information that can be recorded includes:

- Date of contact
- Vendor Comments
- Forecast delivery date
- Likely date
- Expeditors comments
- Next Contact date
- Shipping details

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Material deliveries are recorded on **Delivery Dockets** and increase the TOTAL stock available.

Material Issues deplete the TOTAL stock available. A Material Issue may be accompanied by a movement docket.

Movement dockets are used to transfer material between locations. They do not deplete the total stock available, only stock at individual locations.

Deliveries

Recording the delivery of material from suppliers is a crucial function of the QMS system since this process allocates the material received into stock at the location receiving the material.

QMS provides two options for the rapid and accurate recording of material deliveries:

- Direct entry of partial or completed deliveries against purchase order line items via the Delivery Wizard. Progressive deliveries are supported.
- Entry against an "unknown" order with the facility to later assign an order to the delivery when this information becomes known.

QMS can also record heat numbers of delivered material if required for traceability purposes.

Movements

Once material from suppliers has been delivered to one or more locations, and recorded as such, the material can then be transferred to another location using a "Movement Docket". Typically, Movement Dockets are used to record the movement of material from:

- A warehouse to another warehouse
- A warehouse to a fabrication shop or site
- A fabrication shop or site to a warehouse (returns)

A movement docket records both the dispatch details and also the acceptance of the material by the receiving location. Movement dockets are created by direct data entry, or automatically when accompanying a Material Issue.

A movement docket does not effect the total quantity of material "in stock" for a project, only the quantity of material currently "in stock" at any one location.

Issues

An issue of materials is the means by which materials received are finally allocated against drawings in the Bill of Materials. Typically, an issue of materials is generated in the following circumstances:

- Material is required on the fabrication shop floor at a workshop location
- Material is required for installation in the field at a site location

An "issue" of material depletes the TOTAL stock available (the totals of "in Stock" at all locations) on a project. A material issue is generally accompanied by a movement docket.

QMS includes some powerful features for automatically generating issues of materials and the associated paperwork required.

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Material Availability

Early identification of shortages is a key part of the materials management process. QMS enables planning to take place from either forecast deliveries (purchasing module)or material in stock (deliveries module).

For example, "what will I be short off based on planned production over the next two weeks and taking into consideration the expected deliveries in this period".
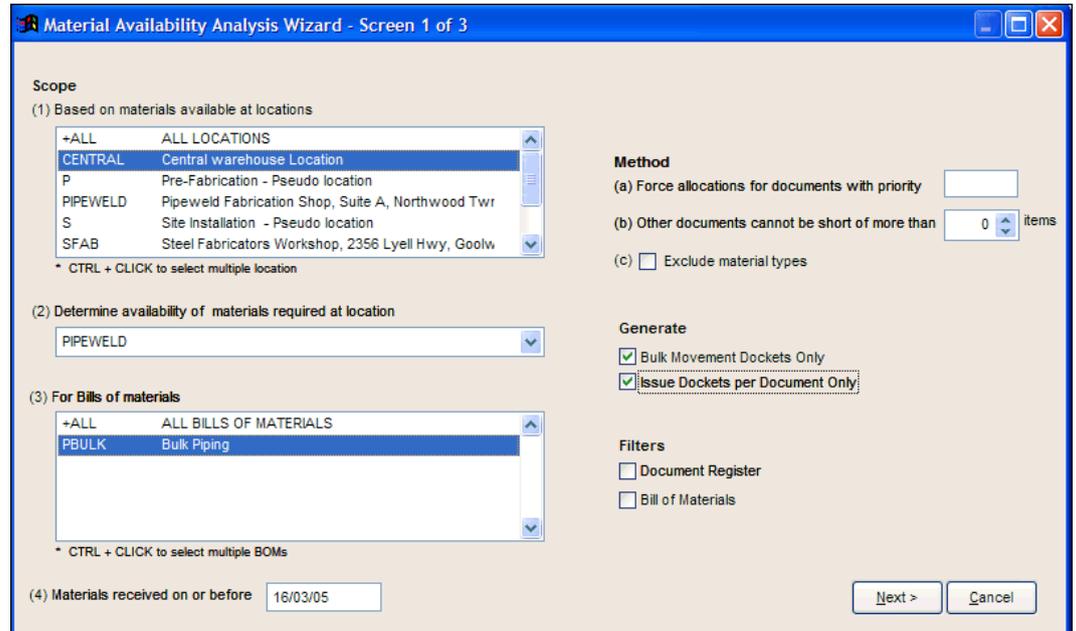
Alternatively this kind of analysis can be based on material in stock using the unique materials availability analysis wizard.

The QMS material availability analysis wizard is a powerful tool, for not only analysing what work can take place with the material currently in stock, but for generating the necessary paperwork for the issue of material.

The Analysis can be carried out for:

- The work required at a particular location . . .
- for one of more areas/packages of work . . .
- taking into account material in stock at one or more locations . .
- and the priority of the work to be completed.

Once the analysis has been performed, QMS can automatically "issue" the correct material, and generate a movement docket to accompany the material issue.

Stock Control

QMS provides the tools necessary for stock taking, reconciling the calculated "stock on hand" against physical stock, and tracking down stock discrepancies.

QMS calculates the stock at any location as follows:

	Quantity of material delivered
Less	Quantity of material sent out on movement dockets
Plus	Quantity of material accepted on movement dockets
Equals	Stock on hand at location

The total quantity of stock on hand for the project is summated from the stock on hand quantities at each location.

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Summary

- Multi disciplined materials management for Piping, Steel, Electrical, Instrumentation and more.

- Bill of Materials management with full change control.

- Auto generation of inquiries and purchase orders from the Bill of Materials.

- Priced delivery dockets for accounts reconciliation

- Integration with corporate and CAD Design software.

- Full audit trail on Purchase order revisions and expediting contacts.

- Optimise fabrication from limited material (piping only)

- Stock control and reconciliations for multiple locations.

- Auto generation of Material issues and full traceability.

- Progress management on and off site for spools and steel.

PROJECT INFORMATION MANAGEMENT TOOLS

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