

# **Guide to Purchasing Management in a Manufacturing Business**

## **A Step by Step Guide to Purchasing and Supply Chain Management**

By BizMove Management Training Institute

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## 1. Introduction

Jim Black, the owner of a small foundry, complained bitterly one day about the amount of defective material he was receiving. "The raw material is guaranteed to meet quality specifications so as to contain less than .005% impurities. For the past three weeks, though, our castings have been turning out rougher than they should. I'm sure that last shipment of raw material wasn't as pure as it should have been. What do I do now?"

In another plant, Joe White was wondering what to do about a new supplier of electronic components he had just purchased from. "I got a good price on the first shipment, and so signed an order for two more shipments. The bill I got for this last shipment is almost \$600 over that of the first. I told the supplier to take it back or reduce the bill, and he said that his quotation gave him the right to increase prices as inflation and labor expenses rose for him. I know I could get the shipment for less, elsewhere."

Both these situations highlight the need to follow good purchasing procedures to reduce the incidence of such problems.

In this guide you will review the activities which lead to effective purchasing. Specifically, you will explore the procurement cycle which concerns decisions on:

how to determine the firm's purchasing needs

finding a supplier who will best satisfy purchasing needs

negotiating and making the purchase

communicating the purchase decision to the supplier and to relevant personnel within your firm, and

a follow-up procedure for evaluating your purchasing decisions

**What is the function of a buyer in a manufacturing firm?** At first glance, it may seem to be to find and purchase a quantity of material for the best price. But price is not the only concern. Low-priced material may not be a bargain if it is of unacceptable quality or if delivery is not reliable.

Clearly, the purchasing function involves more than obtaining the best price. It also involves buying the best value, which means buying:

the right quantity and quality

at the best price

from suppliers who are reliable and provide good service

One way to obtain the best value on a purchase is to set purchasing objectives and carefully follow the procurement cycle. This is explained later in this section.

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## 2. Purchasing Objectives

It is often helpful to state the goals of purchasing for your business. In this way, you will never lose sight of the purpose of the purchasing function and will be able to make more intelligent purchasing decisions.

Here is a sample list of purchasing objectives:

to provide an uninterrupted flow of materials and services for company operations

to find reliable alternative sources of supply

to buy at the most economic order quantities

to buy the best value: a combination of right quality at the best price with the best supplier service

to maintain good relations with vendors

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## 3. The Procurement Cycle

Effective procurement consists of a series of steps which form a cycle. The steps in the cycle can be described as follows:

**1. Determine needs.** Before you buy anything, it is necessary to know what you need to buy and how much. It is important to remember that determining what you need involves not only quantity, but quality decisions as well. Determining and specifying appropriate quality requirements, in some situations, is a more difficult task than deciding what quantity to buy.

**2. Select the supplier(s).** When there are many suppliers to choose from, it is not simple to choose those who will give the best value - not only in price but in service, and consistent quality as well. Selection of suppliers may also mean finding more than one acceptable vendor if the purchased product is so important that you would suffer substantial losses if it were not available. In such a situation, in case the primary supplier cannot meet your needs as a result of a heavy workload, strike, unavailability of raw materials, etc.

When deciding to use more than one supplier, you have to weigh these advantages against the possible disadvantages of higher price and poorer service when you buy smaller quantities from two vendors rather than larger quantities from a single, reliable one.

**3. Negotiate the purchase.** In addition to specifying quantities and obtaining agreement on price, this can involve guarantees, method of payment, containers and

packaging, delivery dates and other details of the purchase. Proper documentation of the purchase agreement is part of negotiation and assures that any questions or disputes that may arise will be settled in line with your expectations.

**4. Follow-up.** Here you look at the quality of product and service as well as the accuracy of quantities to determine what improvements, if any, are needed for the future.

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## **4. Determining Purchasing Needs**

### **Determining Quantity**

The quantity of material you will need to buy depends on:

- a. how much material you will use in production
- b. how much may be lost through damage or defects
- c. what you have in inventory when you place the order, and
- d. the average inventory you are willing to carry

To hold total costs of materials, including purchase price and inventory carrying costs, as low as possible, it is desirable to separate purchased components into A, B, and C categories.

These categories are determined by the characteristics of the materials, their use, and their supply. The more erratically used, expensive, perishable and/or exceptionally bulky class "A" components are generally kept under tight inventory control. Status of these components is reviewed frequently and they are purchased in relatively small quantities against a production schedule (see next heading - Determining Quantity Based on Production Schedule).

Class "B" components are less expensive than the "A" components and are either erratically used or perishable or bulky. They are best controlled using perpetual inventory records which show an order point and the quantity to be bought. In this way, purchasing is a fairly routine activity except during the seasonal or annual review periods when all ordering decisions are evaluated.

Class "C" components are the least important components of the inventory. These "C" components can be kept on a simple visual control system where an order is placed whenever reserve stock has to be used. These materials are usually ordered infrequently and in fairly large quantities.

For the class "B" and "C" materials, optimal order quantities exist (economic order quantity) based on purchasing acquisition costs, set up costs, and inventory carrying costs.

#### Determining Quantity Based on Production Schedule

Most manufacturers who use the same component for a number of different products, use a material scheduling table, similar to the one that follows, to calculate production requirements.

PRODUCT MATERIAL SCHEDULE - JANUARY							
Product	Product Quantity	AC Wire	#3 Wire	#3 Insulation	Switch	Plug (AC)	110V Socket
Desk lamp	40	1200'	50'	30'	40	40	40
Pole lamp	80	1500'	130'	50'	240	80	240
F1. tube lamp	400	1800'	100'	80'	--	400	--
Electric pencil sharpener	300	1500'	--	--	--	300	--
TOTALS		6000'	280'	160'	280	820	280

With such a product material schedule, the total amount of component parts used in one period, or in several periods can be determined. Such a schedule is needed only for those components, or materials, which deserve tight control. These are usually A items (B and C items are controlled without specific comparison to schedules. In their case, an order is placed when the minimum or reserve stock is reached.)

When detailed product material schedules are prepared several months in advance, they provide the information which is needed for scheduling several different deliveries from a large-quantity order which allows maximum volume discounts. Such a table is shown below:

MONTHLY COMPONENT USAGE						
	AC Wire	#3 Wire	#3 Insulation	Switch	plug(AC)	110V Socket
January	6000'	280'	160'	280	820	280
February	5300'	310'	200'	310	900	270
March	7110'	260'	180'	270	850	260
April	3760'	405'	170'	260	875	290

Note that the quantities for the month of January were obtained from the column totals (the last row) of the January Product Material Schedule (shown before). If a quantity discount for large volume purchases is available, it may be more profitable for this manufacturer to buy several months' supply of materials at once, to obtain the greatest

discount - and then arrange to have portions of the order shipped once a month, to aid in handling and storage.

Naturally, if quantity discounts are not available, it is usually more profitable to place frequent orders for the minimum quantities you need, rather than place orders for large volumes which tie up capital and create more handling, storage and obsolescence problems.

### **Determining Quality - value Analysis**

When quality requirements are not obvious, or when there is a need to review what quality level is best, quality requirements can be determined through value analysis which spells out the design specifications for a product. Quality specifications can be made in many ways. They can be in the form of acceptable ranges for:

weight

shape

size

temperature resistance

strength

flexibility

color, etc.

Quality specifications thus can include any physical aspect of the part to be made. They can also be expressed in terms of number of pieces per hundred which do not operate properly or do not meet the specifications.

Another aspect of quality that affects purchasing decisions concerns reliability or appearance of a component. A less attractive switch or support that functions properly may be fully adequate and therefore be preferable to a more expensive model.

Value analysis studies parts, assemblies, and/or packaging, to determine whether there are changes in components or functions which will provide the same "value" for users at less cost, or greater "value" at the same cost. Value analysis consists of the following steps:

defining the function and purpose of the object in study; e.g., to conduct electricity, to hold a metal body together, to propel an object, to turn an axle, etc.

determining alternate solutions: e.g., can the metal be replaced with plastic; can the weight of the object be reduced; can the housing be made with thinner material, etc.?

determining and comparing feasibility and costs of the alternative solutions with the present component: e.g., if plastic is used instead of metal, will it hold up as well; will the

performance of the product be affected; will production costs be lowered; can present machinery be adapted to create the plastic part, etc.?

implementing the best solution

evaluating the subsequent performance

following up and refining the component further, if necessary

Value analysis often results in changes in component design or part material, substituting one part for another, or eliminating a part entirely. Here is a possible checklist for conducting a value analysis:

### **SAMPLE CHECKLIST FOR CONDUCTING A VALUE ANALYSIS**

Can the component be eliminated?

Can a standard item be used, if the present item is not standard?

Can the size of the item be reduced?

Can the weight of the item be reduced?

Can the quality of the item be reduced?

Are the ranges which are specified smaller than necessary?

Are unnecessarily fine finishes specified?

Can the item be made from a less expensive material or more efficient material?

Can the design of the product be simplified to simplify production?

Is it less expensive to make the component in your plant than to buy the component from a supplier? (This point is discussed further, later in this section.)

Can the item be bought for less than it costs your plant to manufacture it?

Can the cost of packaging or shipping be reduced?

Have suppliers been asked for suggestions on how to reduce cost?

One example of determining whether a more or less expensive component should be used in a product is given below.

A certain product which sells for \$150 is guaranteed by the manufacturer to be free from defects. This means that any products returned with defects during the first year have to be repaired free of charge. Last year there were 60 repairs, 45 of them due to one component, part P-38. Repairs related to this P-38 component cost \$12 per unit.

There is one P-38 part in each unit and last year 500 units were sold.

In recent years, sales have been tapering off due to growing customer discontent with the product defect.

The P-38 component costs \$10 each. However, a higher quality component (B-52) is on the market, at a cost of \$12 a piece. This B-52 component is guaranteed by the supplier to reduce the defect rate to less than 2%.

What would you do if you were the manufacturer? Would you replace the P-38 component with the B-52 component, or not?

Factors to be considered when determining whether to replace the P-38 component with the more expensive B-52 component are as follows:

The additional cost for the higher quality component is \$12 for the B-52, less \$10 for the P-38, or \$2 per unit.

The additional cost for the higher quality per year is 500 parts used each year x \$2/per part, or \$1,000 per year.

The cost of repairing P-38 parts each year are: 45 repairs made per year x \$12 per repair, or \$540 to repair P-38 parts each year.

The number of B-52 repairs which would be required each year are: 500 units used per year x 2% repair rate, or approximately 10 repairs on B-52 components each year.

The annual cost of repairing the B-52 components is: 10 repairs made per year x \$12 per repair, or \$120 to repair B-52 components each year.

The net costs saved on annual repairs is then: \$540 to repair P-38 components, less \$120 to repair B-52 components, or \$420 would be saved each year by using the higher quality B-52 component.

The net cost each year of using the higher quality B-52 component is: \$1000 per year of the additional cost of using the B-52 component less \$420 per year saved on repairs. It would cost \$580 per year to utilize the higher quality B-52 component in manufacturing.

The decision, thus, is a difficult one and would amount to a reduction in profit of approximately \$1.15 on 500 units sold. If it will stop the loss of sales, or even reverse it, the new component may be worth the extra net cost.

A similar analysis, in a different situation, could show a much better picture and result in a gain, either from the use of a higher quality or a lower quality component.

Frequently it is possible to obtain less costly components which require some redesign or manufacturing process change with a significant initial investment. These decisions, too, require detailed analysis to calculate the advantages they may bring.

## **ON-THE-JOB ACTIVITY**

Use the summary checklist shown earlier to conduct a value analysis of several items which you use or manufacture within your business and where you believe that savings



may be possible. If you cannot easily identify such items, select components or products which are widely used so that even small economies you achieve are likely to bring large dollar savings.

If possible, discuss your thoughts with a person whose opinion you respect and see what additional ideas come from such a discussion.

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## **5. Make-Versus-Buy**

An important aspect of value analysis is to determine whether it would be more economical for your firm to manufacture a component part or to buy the part from a supplier.

Even if you have a supplier who gives you a good price on materials you purchase in fairly large quantities, it may be worthwhile to determine how much it would cost your firm to make such materials. Sometimes such an analysis provides valuable insights for negotiating price with a supplier. In this way, you have a better knowledge of what the breakdown of costs are to manufacture the component, and will be in a better position to realistically evaluate the price and discount schedule which the supplier offers. Obviously, if your firm can make the same part less expensively than it could buy it from a supplier, you should seriously consider manufacturing it yourself.

Many small businesses will make parts where they feel they have the know how and equipment and will buy where the technology is beyond their expertise, or where the part cannot be handled with existing equipment. However, since capabilities improve and technology changes from year to year, it is important to consider the make-versus-buy decision on a regular basis.

Companies in highly competitive industries often have to find ways to make as many of their own parts as possible to reduce costs. Firms in growth industries, on the other hand, usually can make better use of their capital to expand product lines, rather than investing it in equipment, materials and additional space for making components.

One very important thing to remember when making the decision whether to make or buy components, is to base the decision on all the facts. Often, the facts are incomplete and misleading at first glance. Quick decisions are therefore best avoided where possible. Here are two summary checklists which you might want to consider before you make a "Make-versus-Buy" decision.

### **SUMMARY/CHECKLIST: FACTS TO CONSIDER BEFORE DECIDING TO MANUFACTURE A COMPONENT**

If, at first glance, a make - buy decision seems obvious, look again: Can better suppliers than current ones be found?

Can a lower price, without loss of quality, be obtained?

Consider all costs involved in production:

Labor

Material

Overhead - make sure the normal overhead is applicable and that the 'real' overhead is not exceptionally high or low; for instance, waste or space requirements should not be significantly higher than normal

### **General administrative costs**

Will you depreciate the required capital as quickly as you would if you invested it elsewhere?

Consider that production efficiency may be low at first, since you will need time to iron out any bugs in the operation.

Consider whether the required quantities will be large enough to justify the set-up costs and manpower training needed to produce the component, but not so large so as to disrupt production schedules.

Determine whether the demand for the part is stable, seasonal or temporary.

Be sure your company can produce the desired quality with the contemplated production process.

Check for patent considerations which would require you to obtain a license in order to make the part.

Determine whether present knowledge and personnel are adequate for producing the part, or a special skill is involved.

Determine whether you can use present equipment, or whether new equipment must be leased or bought.

Determine whether special considerations will affect scheduling manpower and production.

### **SUMMARY CHECKLIST: FACTS TO CONSIDER**

#### **BEFORE CHOOSING TO BUY A COMPONENT**

If, at first glance, it looks better to buy a component rather than make it, look again!

Consider all costs involved in buying the component:

Packaging costs

Freight and shipping expenses

Receiving costs

Any extra handling costs

Determine whether the supplier is reliable.

Determine whether the supplier can meet the quality standards for producing the component.

Check to see if the supplier guarantees the quality of the component.

Check the supplier's defect rate for producing this component, and how much would it cost you to make repairs on returned items due to the defective component.

Determine whether you will normally receive deliveries on time.

Determine the probability that the supplier might be unable or unwilling to supply you due to a strike, fire, or the needs of more important customers.

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## 6. Selecting Suppliers

Every business must periodically review and evaluate its present suppliers and compare them with alternate suppliers. In some cases where you have a very limited selection of suppliers, this may be an easy task. However, if you can buy nationwide, or worldwide, you can never be certain that you have the very best supplier.

Furthermore, for every important component which you buy, more than one supplier should be available so you are protected in case of emergency.

What Makes a Desirable Supplier

When evaluating a supplier, several characteristics should be considered:

**Reliability of the material** - Is quality consistent from one unit to the next? This may concern the physical characteristics of the product, as well as efficiencies and durability in operation and the number of units that fail to stand up during use the way customers have the right to expect.

**Price** - There are many aspects to price in addition to a low price. Lowest price is not necessarily a primary indication of a good supplier. A desirable supplier can be counted on to charge fairly when something has to be ordered urgently and price cannot be established. When orders are increased, when changes in specification have to be made or when misunderstandings occur which lead to damage or rework, in these situations it is important to have a supplier who is fair and reasonable. Reasonable quantity discounts and credit terms are two other aspects on which the quality of a supplier can be judged.

**Delivery** - Quick and reliable delivery from a supplier is always desirable. When delivery is unreliable, problems of stockout can occur which creates the need to keep un-

necessarily high safety stocks in inventory. Slow delivery can also result in the need to maintain larger average inventories because it is more difficult to predict how many units will be required between order date and delivery.

**Servicing Problems** - Another aspect of supplier quality concerns the way the supplier adjusts shortages in delivery, and provides repair or replacement of unsatisfactory or defective material.

**Stability** - You want suppliers who have the financial and managerial resources to provide an uninterrupted flow of goods or services.

**Special Services** - Suppliers who agree to space deliveries are more desirable than those who don't. They allow you to take advantage of quantity discounts by purchasing larger quantities yet do not make it necessary for you to increase storage space or inventory carrying costs by delivering the entire order at once. Other services that may make some suppliers more desirable than others include creativity in problem solving and in making suggestions for improvements in usage of the materials they supply.

**Accessibility of Seller** - Sellers that are difficult to contact, are less desirable than those whose decision makers are available for quick quotations or for discussions to rectify any problems that may come up.

## **ON-THE-JOB ACTIVITY**

Evaluate two or three of your present suppliers on the basis of the checklist provided above to determine how desirable each one is.

If possible, discuss your thoughts with a person whose opinion you respect and see what additional ideas come from such a discussion.

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## **7. Sources of Information About Suppliers**

Information about suppliers may be obtained in several ways:

**1. An interview with the seller.** It is usually possible to obtain the information you need about a supplier from the sales representative who calls on you. You can ask questions concerning the quality of the product, price, service and delivery, and obtain references you can check to verify the information you receive.

**2. Visiting the supplier.** A visit with a supplier of important components or materials is sometimes desirable when you should know how well equipped the supplier is to meet your needs. Such a visit can give you firsthand insight into the adequacy of the supplier's manufacturing facilities and knowledge of technology as well as labor relations and quality and production control procedures. The supplier's financial standing and managerial capabilities can also be reviewed. During such a visit you can look at the supplier's basis for quoting prices, discounts, terms and delivery. Such visits

should be made only after the choice of vendors has been narrowed down to just a few potential suppliers.

**3. From a cost breakdown or cost analysis.** Since costs are of major importance in the determination of price in many negotiated purchases, it is useful for buyers to obtain a good understanding of product costs. Most suppliers calculate their overhead and general administrative expenses as a proportion of direct labor and/or direct material.

Smart buyers, therefore, look to help suppliers achieve reductions in the supplier's direct costs (possibly through joint value analysis), since these are likely to have a greater impact on price than other cost savings or a reduction in the supplier's percentage of profit.

Cost analysis is not needed in all purchasing situations. It obviously will be worth the investment in time and effort only if the quantity is large.

In analyzing costs, it is also important to remember that many factors affect the costs of individual firms and even the costs of individual products. Thus, a specific firm may be a high cost producer for one item and a low cost producer for another.

In situations where only one supplier is available or preferred for various reasons not related to price, cost analysis may be the only way for determining whether prices are fair and reasonable. In such a situation, the price is usually negotiated. At the start of such a negotiated purchase, it is desirable to request a cost breakdown from the supplier.

Such a cost analysis might include cost information on:

material and purchased parts

scrap and salvage value (if any)

direct labor

overhead calculation

engineering and development expenses, where applicable

general and administrative expense calculation

depreciation of special equipment

**4. References from others who use the supplier.** Business contacts and references provided by the vendor can often provide information about the quality of products and services of a supplier. This is also one way to find out how well the written and verbal word of the supplier corresponds with actual performance.

**5. Trial business with the supplier.** When purchasing from a new supplier, it is often desirable to make a few small purchases to see how well the supplier fulfills agreed-upon obligations. When conducting trial business with a supplier, it can be beneficial to maintain large safety stocks of the material being purchased, as insurance.

**6. Supplier catalogs.** Catalogs are a frequently used source of information about those suppliers who provide them. Such catalogs are useful not only to determine potential sources of supply but also, on occasion, to obtain published prices.

**7. Sales people.** Most supplier sales representatives can provide information about possible sources of supply of non-competing products or services. Since they call on many different companies, salespeople can bring much information about the quality of suppliers and, when they do not know themselves, can get answers to your questions from some of their customers. All this information is available to the alert, open-minded buyer. However, salespeople can take up a great deal of your time. So as not to be bothered by salespeople at inopportune moments, you may wish to inform salespeople over the telephone or through signs, that there are specified times set aside during which your firm will be willing to see sales representatives.

Many small firms do not have so many salespeople call that specified times are necessary. When salespeople call, it is therefore better to limit the amount of time you spend with them, rather than to shut them out altogether.

**8. Trade magazines.** General and specialized trade journals often contain advertisements placed by suppliers as well as economic information of value for purchasing decisions.

**9. Purchasing files.** If you keep detailed files of brochures offering products and services, reviewing these when an occasion arises can provide you with valuable information for selecting a supplier.

**10. Trade registers and directories.** Thomas' Register of American Manufacturers is one of several widely known trade registers which contains information on the addresses, branches, affiliations, and often financial standing, of all leading manufacturers.

**11. Trade exhibits.** Exhibits provide an excellent opportunity for you to see a variety of suppliers and their services or products. They represent an opportunity to compare similar products of different manufacturers.

**12. Yellow pages.** The yellow pages within a phone directory contain an accurate listing of local suppliers.

**13. Internet**

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## **8. Making The Purchase**

The major objectives in making the purchase are:

1. To obtain a fair and reasonable price.

2. To negotiate the terms of sale and determine type of purchasing contract.
3. To motivate the supplier to meet all obligations.
4. To develop a solid relationship with competent suppliers.

### **Fair and Reasonable Price**

Cost analysis and Value Analysis, are two methods for obtaining the information with which to negotiate a good price. Competitive bidding and an investigation of published price lists, where available, are two other ways for assuring that the price you arrive at will be a fair and reasonable one. In competitive bidding, it is important, however, not to accept the lowest price, unless it is clear that the vendor will be able to deliver and make a reasonable profit on the sale.

It is rarely to your advantage to accept an exceptionally low price from an inexperienced vendor, or one which is the result of an error.

**Competitive bidding** is appropriate in situations where:

the bids are easy to obtain (through a phone call or simple letter)

the value of the purchase is large enough to justify the expense to obtain and evaluate bids

the specifications of the item or service to be purchased are simple and clear to both the buyer and seller

there are an adequate number of sellers in the market who wish to bid on the contract and are willing to price competitively to get it

there is sufficient time to utilize this method of purchasing

### **Negotiating Terms of Sale**

To run your business efficiently you must have reliable and prompt delivery. Furthermore, you want to keep the lowest inventory possible while keeping enough stock on hand to satisfy customer needs. You also would like to sell as many units of a new shipment as possible, before you have to pay for it. When negotiating a purchase, therefore, you want to obtain:

prompt delivery

split shipments

as much time as possible, after delivery, to pay the bill (dating of invoices)

cash discounts

lowest possible freight costs

Obviously, you cannot expect to get everything from your supplier all the time and still be considered a desirable customer. Therefore, you must use judgment on how hard you want to push.

Split shipments are important only when there are quantity discounts; if the vendor grants such split shipments to other customers then there is no reason why you should not get them too.

The same is true of "dating" of invoices, a practice in which, at least at certain times of the year, some suppliers will permit you to buy and accept delivery but pay as much as 60 to 120 days after receipt of the merchandise.

Cash discounts usually are shown on vendor invoices. Sometimes, however, they have to be requested. These discounts can be 1 or 2 percent off the total order if you pay in full within 10 days. While 1% may seem unimportant, a 2% discount does represent a small saving. Besides, paying promptly may create better relations with vendors and may lead to better credit ratings. This, in turn, can lead to better deals with suppliers.

Freight costs can be an important item, especially if purchased components are either bulky or heavy. Sometimes a good buyer can get the vendor to absorb freight costs or, if that is not possible, obtain special freight arrangements in which the supplier routes and schedules shipments in such a way that shipping costs are minimized.

Sometimes, if you do not ask for it, the representative may not tell you that split shipments or dating or cash discounts can be granted. It is up to you, therefore, to bargain for them.

**Reciprocal Buying.** One type of negotiation which deserves special mention is reciprocal buying. Reciprocal buying is simply the practice of giving preference to suppliers who are also customers. Since it is rare that a customer can also be a supplier, reciprocal buying is not a widespread practice.

Obviously in those situations where it is possible, it can be good business to buy from companies that are also customers if all factors of service, quality and price are equal, since this practice strengthens the relationship and turns a customer into an even better one.

Unfortunately, reciprocity is not used only when quality price and service are equal. If either party is less than a highly desirable supplier, problems can develop.

Furthermore, although reciprocity is not against the law by itself, it could develop into conspiracy and commercial bribery, which are illegal. In the case of large corporations, it may be a violation of the anti-trust laws.

Reciprocity, for all these reasons, should be approached with caution. If you are in a situation where it can be important, it would be wise not to use your customer as a sole source of supply for the product or service involved.

## **Determination of Purchasing Contract Type**



The type of purchasing contract selected for any given order always affects the purchase price of the order. It is, therefore, important to consider different contract types.

There are two basic types of contract: Fixed price contracts and cost type contracts.

### **Fixed price contracts**

**Firm fixed price contract** is a type of contract which is most preferred by all buyers and perhaps most frequently used in small businesses. Whenever a fair and reasonable price can be determined, a fixed price contract is desirable to use. Such a contract provides the vendor with a maximum incentive to produce efficiently and all financial risks are borne entirely by the vendor.

**Fixed price contract with an escalation clause** is often used for contracts involving purchases upwards of \$200,000 and a long production period. The escalation clause allows for an upward or downward change in price as a result of changes in either material prices or labor rates. This type of contract is often used in construction industries.

**Fixed price contract with redetermination** is often selected in situations where the amounts of labor and/or material (as well as prices in some cases) are difficult to estimate because changes in specifications or other requirements are likely to occur. In such uncertainty, a firm fixed price contract would be impractical but a fixed price can still be useful since it establishes a mutually agreed-upon base which covers the bulk of the purchase and establishes a formula for calculating fair prices for the expected changes from the basic package.

**Fixed price incentive contract** is another variation of the fixed price agreement. It provides for a target price, and a cost plus profit formula. The agreement usually specifies a higher profit for the vendor if savings below the target price can be achieved. Sometimes this is coupled with a penalty which applies if the formula would bring a price equal to, or exceeding a ceiling figure. Sometimes this ceiling is higher than the target and sometimes it is the same.

### **Cost Type Contracts**

Cost type contracts are used when it is impossible to contract on any of the variations of a fixed price discussed above. The major difference between a fixed price and a cost type contract is that under a cost type contract, the buyer assumes almost all the financial risks. The seller is usually guaranteed all costs up to a predetermined amount as well as a fee. A seller, therefore, has no real incentive to keep costs or prices down. Cost type contracts have the additional disadvantage that they may require thorough auditing.

**Cost plus percentage of cost contract** is the most undesirable of all of these types of contracts. It is often used in many private firms, mostly in the construction industry. This type of contract tends to inflate costs since higher costs will bring greater profit to the supplier.

**Cost plus fixed fee contract** provides that the supplier be paid for all allowable costs plus a fixed fee which is either a percentage of the estimated cost or a lump sum.

**Cost plus incentive fee contract** is basically the same as the fixed price incentive contract except that the supplier usually is paid for all costs and the fee varies depending on the relationship between actual costs and budget.

**Cost sharing contracts** are often used in situations in which the supplier can benefit if the product being developed for the buyer can later be used with other customers. Under such conditions, the buyer and seller often agree to split the costs.

**Cost without fee contracts** also exist. They are usually only use with non-profit institutions where work such as research is done without a fee except that which is necessary to recover overhead costs. Some government supported consulting organizations and colleges may provide services on this basis.

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## **9. Preparing The Purchase Order**

The purchase order specifies an agreement between the seller and the buyer.

The objective of a purchase order is to communicate within your own firm and communicate to the supplier the quantity, quality, and type of materials or services being ordered, as well as the prices agreed upon, the method of packaging and shipment, credit terms, and any conditions or specifications which must be met.

A purchase order should contain at least the following information where it applies:

buyer's name, address and signature

supplier's name and address

date

shipping address

shipping instructions

customer identification number

model number

verbal description of item(s) being purchased

quality specifications

quantity

dates required

packaging instructions

unit price discount

net amount

terms of payment when extended

standard conditions such as maximum overshipments which will be accepted, liability during transit, method of dispute settlement, Underwriter Laboratories and other safety standards, etc.

In addition, many firms print a series of standard terms and conditions on the back of each purchase order. These are, of course, different for different firms. Their purpose is to provide a measure of legal protection in the event of disputes with the seller on matters concerning some or all of the following:

Definitions

Price

Delivery provisions

Warranty and specifications of the materials

Packing

Title

Insurance

Patent infringement

Labor

Taxes

Compliance with law

Subcontracting or assignment

Modifications of terms and conditions

Contract termination

Invoicing and payment procedures, including discounts if they apply

Legal effect and proceedings

Motivating Suppliers to Meet Their Obligations

In general, manufacturers who want to motivate their suppliers to give them outstanding service and who expect to have reliable vendors must, of course, follow the golden rule

and treat good vendors the same way as they want to be treated by their customers. This means that, as buyer, you should not:

regularly request quotations from a vendor who rarely, if ever, receives an order.

always push the vendor for the lowest price available anywhere

constantly expect the vendor to accept emergency conditions which often are the result of poor planning

blame the vendor for mistakes which could have occurred in your own shop

always force the vendors to do rework or repairs on quality problems when the quality problem is not serious

strictly insist on tight delivery dates with all purchases

delay in placing orders and then ask that they be given great urgency, etc.

Good relations require an understanding of the vendor's needs and willingness to solve problems in a constructive, positive way.

The purchase order should be a multiple copy form so that the purchase may be effectively communicated to all relevant personnel within your firm. Typically, copies of the purchase order are distributed to purchasing files, and to warehouse or receiving personnel who must check the shipment against the purchase order.

In addition, scheduling/inventory control and possibly quality control people may receive copies.

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## **10. Receiving And Inspection**

Many manufacturers lack clear documentation of receipt of shipments. This can cause problems when the business has to prove that there was a shortage in shipment or that the shipment does not meet quality specifications, or when other problems exist.

### **Receiving Report**

Upon receiving purchased goods or even services from a supplier, it is important that the shipment is checked to make sure that the correct quantity and quality was received. A receiving report should immediately be completed which indicates:

the date the material was received or service was performed

whether the delivery was on time

the quantity of material received and whether any discrepancies exist when compared with the packing slip

whether the quality of the material meets specifications

the names of the personnel who performed these checks

This receiving report can be of great help to the bookkeeper in maintaining accurate records, and when paying the bills.

### **Quantity Check**

When a shipment arrives, it is a good idea for receiving personnel to check it against the packing slip to make sure that the quantities are correct.

The thoroughness of the quantity check depends upon how many packages are involved, and how important the contents of the package are. If there are many packages, and there are many items in each package to count, complete counts would be a very time consuming process. In such cases, it may be better to use sampling to establish the quantity received.

Total weight or physical dimensions can be used for fairly accurate estimates of quantities in a shipment. When the material is packed in boxes, suppliers can be asked to write the quantity on the outside of each box so that in a shipment of several or many boxes, a few can be picked for a detailed check. If they turn out to be accurate, then there is considerable assurance that the shipment is complete.

A bulk count may be necessary when unit price is high. The receiving report should show how the count was made, i.e., by full count, by weighing and calculating the quantity, or by spot checks of packages.

### **Quality Inspection**

It is important, upon receiving a shipment, to make sure that the material meets quality specifications. If it is of great importance that no defects in quality exist, you will probably want to run a quality check on each item of the entire shipment.

If, in your manufacturing process, you are able to detect defective materials, and it is clear that the problem lies with the supplier, then the incoming quality check can be limited to assuring that there is no massive quality problem which would disrupt your production.

In some cases, however, defective material could pass through manufacturing operations unnoticed, or a problem in production could be the fault of your people. In such situations, it is wise to conduct a quality check of materials, upon receiving the shipment.

However, since checking items against design specifications can be quite time consuming and expensive, it is rarely necessary to run a quality check on all items received.

Instead, spot checks on quality can be made on a small representative portion of the shipment. The reasoning behind spot checks is that if some of the material is defective,

then you should have a fairly good chance of finding some defects if you sample items at random. Thus, you might pick some material from different places in the shipment. In the case of several packages, you might select a few pieces from the top of one package, from the bottom of another one, from the sides of a third one, etc., and run quality checks on this material instead of on the whole shipment.

Some conditions for using spot checks, or sampling, are as follows:

Complete accuracy in locating all defects with a shipment cannot be required. No sampling method can find all defective material.

It should be possible to obtain a representative sampling of materials from the shipment.

An accurate method for judging the quality of the material must exist. A quality inspector must be able to reliably judge what is acceptable, and what is defective.

The procedure for correctly sampling material and conducting spot checks is somewhat complicated, however, and involves looking up figures in statistical tables. One principle, of course, applies: a larger sample size, or spot checking more items, will naturally increase chances of finding defective parts, if they exist.

For example, a certain manufacturer receives a shipment of 450 components: Part B-250. Defects in these parts are unlikely to be detected during manufacturing operations. Usually about two or three defective B-250 parts are found in every 100. The purchasing manufacturer may feel that up to 3% defective parts are acceptable, but if there are more, the supplier should take the shipment back to remove the bad pieces. A table like the one shown below can be used to decide how many pieces have to be checked to gain reasonable assurance that the defect rate is 3% or less. Such tables can be found in many quality control books.

**SAMPLING INSPECTION TABLE**  
Lot Tolerance Percent Defective = 3.0%

Lot Size	Simple Check		More Detailed Check	
	Sample Size	No. Defects Allowed	Sample Size	No Defects Allowed
1- 40	40	0	40	0
41- 55	40	0	40	0
56- 100	55	0	55	0
101- 200	65	0	65	0
201- 300	70	0	110	1
301- 400	70	0	155	2
401- 500	70	0	160	2
501- 600	75	0	200	3
601- 800	75	0	240	4
801- 1000	75	0	290	5
1001- 2000	75	0	380	7
2001- 3000	75	0	460	9
3001- 4000	130	1	540	11
4001- 5000	130	1	620	13
5001- 7000	130	1	700	15
7001- 10,000	130	1	775	17
10,001- 20,000	130	1	900	20
20,001- 50,000	130	1	1090	25
50,001- 100,000	130	1	1215	28

Looking at the line in the table for a Lot Size of 401 to 500, it can be seen that a sample of 70 pieces should be selected. In this sample, there should not be a single defective piece. If one should be found, the more detailed check can be used and a larger sample of 160 could be selected.

If more than three parts are found defective in the larger sample, then the probability is quite high that there are more than 3% defective and that the shipment does not meet quality standards.

### **Report To Accounts payable**

To assure that payment will be made only if the merchandise which the vendor bills has been received in the proper quantity and of acceptable quality, the person making out the check should compare:

purchase order

receiving report

packing slip, when one is received, and  
invoice from the vendor

These documents should therefore be filed together so they are available when bills are being paid.

## **FOLLOW-UP**

Good purchasing procedures require follow-up evaluation of suppliers, and sometimes even of individual purchases. You should consider whether or not your purchasing objectives have been met and whether you are buying the best overall value in terms of the best quality, prices and service. Did the supplier provide on-time delivery and quality as promised? Were there any considerations which were forgotten in deciding upon the purchase? Did you buy the most economical quantity? Did the supplier satisfactorily resolve any problems which may have cropped up? These are some of the questions you should be asking yourself at this time.

Answers to these questions provide ideas on how purchasing can be improved in the future.

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