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The Critical Review Of Equipment In Industry

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Abstract

Critical assets or critical equipment can be defined as important assets that your organisation requires to maintain operations and reach company goals. If degraded, broken, or unavailable, these assets would greatly impact the reliability of your operations. A criticality rating given to a piece of equipment is used to determine how often the equipment should be inspected or maintained, as well as to give a scheduler a guide as to which notifications and work orders can be rescheduled to a future date, and which require more immediate attention. Equipment is any piece of equipment or machinery that could do any of the following: Significantly impair the ability to safely meet business objectives. Adversely affect quality levels. Violate environmental standards of the business organization. Failure of an equipment unit that causes an immediate cessation of the ability to perform a required function. Includes failures requiring immediate action towards cessation of performing the function, even though actual operation can continue for a short period of time.

Keyword: Industry, Laboratory, Equipment's.

Introduction

Construction industry is second largest industry in India after agriculture. Construction industry can great influence on the economy of the any country. Lots of cost and investment done every year in construction industry. Especially for developing country like, India due to heavy investment overall GDP (Gross Domestic Product) is affected. In construction sector Various costs are being involved in construction sector like, labor, material, equipment, (resources) land, etc. Equipment cost is major cost in construction sector. Equipment management is the part of project management. Effective management of resources in construction projects can produce significant savings in time and cost. So effective resource management lead to effective project management. For effective equipment management it is necessary to study productivity or output of equipment. For find out the productivity of equipment, study of factors affecting behind them is necessary. In construction project equipment cost is high which affect the overall cost of the construction project. Proper equipment management can increase the equipment productivity which lead to reduce the overall cost of the project.[1,2]

Examples of critical equipment as defined above include but are not limited to: (1) life-support equipment's such as ventilators, (2) resuscitation equipment such as defibrillators, (3) mission-critical equipment such as a CT scanner, (4) dialysis systems, and (5) sterilizers. Safety critical equipment is an individual piece of equipment, a control system or an individual protection device which in the event of a single point failure may: Result in a hazardous situation which could lead to an accident.[3]

CATEGORIES OF MACHINERY AND EQUIPMENT ITEMS

In the International Comparison Program (ICP) classification, the category machinery and equipment is broken down into two groups: [4]

(1) metal products and equipment

(2) transport equipment. These groups are further disaggregated into eight basic headings. Economies are required to collect the prices of several specified items within most of these basic headings.

The five basic headings related to metal products and equipment are: [5]

(1) fabricated metal products except machinery and equipment

(2) general-purpose machinery

(3) special purpose machinery

(4) electrical and optical equipment

(5) other manufactured goods not elsewhere classified.

The remaining three basic headings for transport equipment are: [6]

(1) motor vehicles, trailers, and semitrailers

(2) other road transport

(3) other transport equipment.

STANDARD METHOD FOR PRICING EQUIPMENTS GOODS

The standard method for pricing equipment goods is similar to that followed for consumer goods and services; economies collect prices for identical or very similar products—sometimes referred to as specification pricing.[6]

Pricing Rules

For consistency with national accounts, economies are required to provide prices for equipment goods that are consistent with the valuation of those goods as fixed capital assets in the national accounts. Thus the prices must include the import duties and other product taxes actually paid by the purchaser, the costs of transporting the asset to the place where it will be used, and any charges for installing the asset so it will be ready for use in production. Deducted from the price are any of the discounts generally available to most producers. [7]

The following rules are to be observed in reporting prices for equipment goods:[7-9]

• ***Transport costs:*** When the prices of equipment goods do not include transport costs, these costs should be estimated by economies. They would determine the average distance over which the items are transported from the factory where they are made or, for imports, the port of entry.

• ***Installation costs:*** Costs are usually associated with the installation of fixed equipment, and these costs are included in the gross fixed capital formation (GFCF) in national accounts. Installation charges include not only those paid by the purchaser for physical installation of an item at a factory or other site, but also any charges for testing or calibrating the equipment. In the case of transport equipment, there are usually no installation costs.

• ***Product taxes:*** The price should include only nondeductible product taxes. Economies that levy a value added tax (VAT) normally allow purchasers to deduct the full amount of the tax on capital goods. Sales and other product taxes, and sometimes import duties, may also be fully or partially deductible on capital goods.

• ***Discounts:*** The price should refer to the purchase of a single item so that it is not affected by discounts that may be available for large orders. The price of the single item should be reported after deducting any discount that is customarily available to most purchasers and that is available for most of the year.

EQUIPMENT USED IN PHARMACEUTICAL INDUSTRY [8,11,12]

In this article, we will discuss the most commonly used equipment with their brief description for easy understanding for all who want to know about the list of equipment used in tablet manufacturing.

We will divide equipment according to their area of usage like the following,

- Granulation
- Compression
- Coating
- Blistering
- Packaging

Equipment Used for Granulation [11]

As we know there are two types of granulation, The first one is wet granulation & 2nd is dry granulation, so first of all, we will discuss the list of equipment for wet granulation.

Wet Granulation Equipment [13]

The most commonly used equipment for wet Granulation is given below,

- Sifter
- Granulating Equipment
- Drying Equipment
- Screening Equipment
- Blending Equipment

Dry Granulation Equipment [14]

In dry granulation, for sifting & mixing the same equipment is used as in the case of wet granulation. We know that in dry granulation the pressure is applied over powders to form granules & there is no wetting & drying stage in dry granulation so no wetting & drying equipment is used.

For pressure application, the following may be used.

- Compression Machine for Slugging
- Roller Compactor

Direct Compression Equipment [15]

In direct compression, no complex steps are involved so the following equipment is used,

- Vibro Sifter
- Bin blender or Double Cone Blender

Name of Equipment For Compression [16]

When granules are prepared or powders are mixed the next step is to compress them to form tablets.

The following equipment is used during the tablet compression process.

- Compression Machine
- Deduster
- Metal Detector

Compression Machine [15,17]

- Compression machines are used to compress granules or powder to form tablets using punches & dies which are installed on a rotating table.

Name Of Equipment For Tablet Coating [16-18]

Tablet coating is the process in which we deposit a layer of polymer over the moving bed of tablets.

The following equipment is used during the tablet coating process

- Tablet Coater
- Peristaltic pump
- Mixing Tank

Tablet Coater Perforated Coating pans are used for tablet coating where spray guns are installed in the pan to deliver the automized coating suspension over tablets.

Equipment Used For Tablet Blistering

After tablet coating the next process is to blister the tablets for which blister machines are used.

Blister Machines

Blister machines are used to pack tablets in alu alu or ALU PVC foils. Many advanced types of blister machines are used where pockets are formed & after tablet filling these pockets are sealed, embossed with Batch number & cut into individual blisters.

Packaging Equipment

The packaging is the process where blisters, bottles, sachets, etc. are packed into individual unit cartons also known as secondary Packaging.

Packaging Machines

Process of Packaging in pharma industries is a manual activity but some well-established pharma companies use cartonating machines as well.

DIFFERENT EQUIPMENTS AND SPECIFIC ROLES IN PHARMACEUTICAL & CHEMICAL INDUSTRIES [16,19-21]

A wide range of equipment are made specifically for certain industries, but there are top-graded equipment that has the ability to provide various advantages to several industries.

Paste Kettle: The Paste kettle is an equipment that can be used to make a paste layer from scratch material. This **paste kettle machine** has a containing area where the material is processed and converted into starch paste. A beneficial aspect about this equipment is that the body of the equipment is made up of stainless steel, so that the required amount of heat can be delivered to the raw paste material.

Planetary Mixers: Planetary mixers are an important equipment in industries like pharmaceutical and food industries. The major role of these Planetary mixers is to properly mix up semi-solid and liquid substances. This mixing quality of the **planetary mixing machine** helps in convenient mixing of different types of food grade items like sauces, medicinal syrups, juices, and other edible as well as non-edible items.

V-Blender: The V-blender equipment has the ability to perform a complete dry level blending to the wet & solid substances with freely flowing properties. This **V-blending equipment** also blends the dry powder and granule particles, so that it can be utilized in chemical and various tablets and capsules. A quality aspect about this blending machine is that it can reduce the size of material to its finest form, as required in various products.

FIG: V-Blender

Floor Cleaner Liquid Machine: The Floor cleaner liquid machine are highly qualified machines that are used in chemical industries in order to manufacture any kind of floor cleaning liquid. Various features such as creating less to none foam while processing the liquid cleaner, and minimizing the left out foam in the recovery tank are beneficial aspects that the floor cleaner equipment offers. Along with that, the high processing speed of the machine can decrease the operation time of the equipment.

Liquid Detergent Bottle Machine: The Liquid detergent bottle machine is utilized in order to fill the detergent in the bottle or container. In the process, the containers are kept on a tray, where the material has to be filled inside the bottle. Operations like bottle inspection are also performed by the equipment before the filling process is initiated. This liquid detergent filling machine can accurately stop once the bottle is filled up to its level and size of the container.

Fluid Bed Coater: Fluid bed coater machine plays an important role in chemical industries as well as pharmaceutical sectors. The utilization of the Fluid bed coating equipment is done in various industries for coating up a fluid layer on the tablets manufactured in various industries. This fluid bed equipment sprays a coating of liquid substance which works as a protective surface for the manufactured tablets. All of the above mentioned equipment are highly qualified machines that chemical and pharmaceutical industries prefer installing in their production places. Benefits like reducing workload and increasing production value are additional benefits that chemical & pharmaceutical industries can favour about these equipment.

FIG: Fluid Bed Coater

Tablet Coating Machine: The tablet coating machine is comprised of multiple quality aspects that can benefit industrial sectors. As the tablet is one of the product that is produced in several industries, the tablet coater machine has the ability to cover up the outer surface of any tablet with an additional coating layer, as it protects the tablet from engaging with any kind of dust or unwanted particles present in the environment.

CONCLUSION

We have studied various sources of literatures in this paper which is related to productivity of construction equipment. We have derived various critical factors from various papers from different point of view. An integrated framework of such critical factors affecting productivity, which contained main 4 groups containing different 35 factors which provides an extensive background to enhance knowledge regarding equipment productivity. In construction sector proper handling of these factor can improve the productivity of equipment as well as construction. By increasing the productivity minimize the total cost of the project.

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