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Standard Operating Procedures for MRO Storerooms

Lean and Reliable Practices

Part Storage Fixtures

Frank Murphy, Founder and President Inventory Management Services Inc.

One of the major issues facing manufacturing, industrial, medical, educational, and administration building plant and facilities engineers, as well as maintenance and purchasing managers, is *where* and *how* the spare parts, required to operate and maintain that facility are stored.

Each facility has parts that are unique to their particular operation. A school campus or hospital system faces additional challenges that deal with the number, location and age of their buildings, the replacement of old technology with up-to-date technology, and the storage of the wide variety of parts in different styles which have changed over the years. For example, ceiling tile, lighting, plumbing, and doors are three areas where the differences can easily be seen in a building built in 1960 and one erected in 2007.

Operating supplies and parts storage is further complicated when several buildings are spread out geographically, like at a college or medical campus. It is essential to store the wide variety of parts, many of the same family, in a manner that maximizes the use of available space, accents part storage density, maintains parts in a minimum-yet-sufficient quantity, and stores them in a manner that allows rapid access, location and easy checkout.

With the space limitations usually placed on MRO (Maintenance, Repair, Operations/Overhaul) parts storerooms, it is essential that parts be stored properly. IMS is frequently asked, "What is the best method of parts storage for my facility?" For the manufacturing and industrial sectors, this is easier to answer as most of the parts are small enough to fit into modular drawer cabinets and 12-18-, and 24 inch shelving. However, for a school system or an administrative building complex, parts are generally larger.

Each site has its own special requirements, depending on the number, size, and type of parts to be stored. There is no across-the-board "best method." Often, those responsible for setting up, relocating or modernizing a parts

storeroom think that bigger is better. There are, however, some general guidelines as to what to do and what not to do, what to use and what not to use.

Steel Modular Drawer Cabinets

Without a doubt, steel modular drawer cabinets offer the greatest part-storage density of all available storage media, with the smallest possible footprint. Their ability to store parts in three dimensions (height, width and depth) enables them to do this. These cabinets are popular in the manufacturing industry, as they can store a wide variety of parts, both generic and OEM (Original Equipment Manufacturer). Very small parts, such as miniature light bulbs and overload heaters, up to the larger parts like circuit boards, air cylinders and temperature/pressure gauges, are stored and organized neatly and securely.

In other words, parts as small as an aspirin, up to parts as large as a 5 pound bag of sugar are stored without difficulty. Adjustable partitions and dividers allow for part size, and a text or bar code part ID label can be placed on the divider. Plastic bin cups are available for the very small parts.

Cabinets are approximately 30 x 30 inch square, stand at approximately 60" (eye level), 44", and 39" (bench/workstation) heights, have from 4 to 15 drawers, and come in several colors. Drawers capacity is about 400 lb. load capacity each, and vary in depth from about 2 to 13 inches. Price is determined by the number of drawers selected.

Modular drawer cabinets reduce the amount of total square footage needed for storage and provide additional storage space on top of the cabinets for bulkier, lighter items. They present a layout that is efficient, cost-effective, good-looking, and very professional, and they can be neatly and easily expanded. However, they are more expensive than standard, steel shelving.

Shelving

General Shelving Recommendations

Shelving provides good part storage if both the horizontal and depth features are used completely and effectively. Otherwise, shelf space is wasted. The distance between shelves can be adjusted according to the height of the parts stored on them. Shelving units that are bolted together, and/or the type that is available in retail hardware stores are not recommended for manufacturing MRO spare parts storerooms.

If shelving is the storage media being considered, IMS makes the following recommendations:

- ◆ Purchase *closed* shelving where the backs and side are solid and not open.
- ◆ Use shelving that is 36" wide; 42-48" wide are acceptable but more expensive.
- ◆ Use a common back panel for back-to-back shelving installations.
- ◆ Install cross-braces to increase stability.
- ◆ Use medium-duty, 22 gauge shelving, which has a 600-lb. load capacity.
- ◆ Consider using in-shelf drawer units (knee-to-shoulder level) to increase part storage density.
- ◆ Purchase shelving between 72 and 87" high. Shelving higher than 6' requires use of a step-stool or 4-wheel, safety ladder.

- ◆ IMS does not recommend or purchase shelving over 87” high. Parts-storage and retrieval, visibility, and access (safety) are major concerns.
- ◆ Use metal or sturdy plastic bin boxes to increase part-storage density.
- ◆ Gray is the most common color used in industry.

12” Deep Shelving

While there are a number of applications that use 12 inch shelving, IMS does not recommend the new purchase and installation of 12 inch shelving, unless the clear majority of the parts to be stored on them (over 80 %) are less than 12 inches long. In some industrial storerooms, they work well, especially where common hardware, pipe fittings under 1 inch ID, pneumatic and hydraulic fittings, quick-disconnect fittings, smaller electrical and conduit fittings, plugs, switches, bearings, and smaller OEM parts fit neatly on the shelf.

Frequently, when parts are too large or too long to be stored on 12 inch shelving, they are placed on the top shelf of the unit. Placing parts on top of shelving presents a real danger of striking a fire sprinkler head if the ceiling is low. If some parts are longer than 12 inches, they are stored lengthwise, wasting valuable storage space. Storage in depth is restricted if the parts are 7 inches long or longer. Even if packaged, more horizontal shelving space is required.

At times, parts too large to be neatly stored on 12” shelving are stored on bulk storage or pallet racks. This causes parts to be lost or damaged, decreases consolidation and efficiency, and increases overall carrying costs.

18” Deep Shelving

If there was an industry-wide standard for parts storage, then 18” shelving would measure up well. The 18” depth provides the optimum storage depth for most of the parts that are maintained in an MRO parts storeroom. There is good room for back-to-back parts storage, especially if stored in boxes. Metal or plastic bin boxes can be subdivided with dividers or bin cups, further enhancing parts-storage density.

In every application where IMS has used 18” shelving, part consolidation and organizing increased part storage density. These contributed to reducing the number of parts requiring storage and the lowering of the overall inventory value.

24” Shelving

Shelving this deep is the least useful for general parts storage. Considerable shelf depth space is wasted if parts are not 22-24” long. To store longer parts, IMS has seen two of these units set up back-to-back with no back panel. The shelves both above and below the long parts had most of their shelf space wasted. For storerooms having long, or larger and lighter-weight parts, IMS recommends Bulk Storage Racks, 24” deep, 96” wide and 72’ high.

Bulk Storage Racks

Bulk storage racks are available in several lengths, depths and heights. IMS has used these racks in 24-48” depths, but never over 72” high. Bulk Storage Racks are used to store parts too large, too bulky, or too heavy for shelving. Air filters, flexible ductwork, longer air/hydraulic cylinders, midsize gearboxes, conveyor belting, speed reducers, gear motors, and motors are generally stored on Bulk Storage Racks.

Cross beams can be placed just above floor level so parts are stored up off of the floor. (Some food and beverage plants require this). Or, pallets can be stored on the floor under the pallet racks to hold heavier, larger motors, gearboxes, machine parts, etc.

Pallet Racks

Pallet Racks are usually found outside of the storeroom in a warehouse environment. They store the larger, heavier parts, such as motors, gearboxes, pumps, motor-gearbox/pump combinations, large rolls of conveyor belting, machine parts, and large components and machine assemblies. The heaviest items should be stored on the floor and care must be exercised not to overload storage beams.

Racks come in depths ranging from 24-48”, heights up to 20’, and beam-pair loads up to several tons. As plant building height allows, the taller racks provide excellent use of available vertical space and increase part-storage density and capability. The horizontal space can be divided into storage sections (A-B-C) depending on their length.

In Conclusion

Storerooms can use any combination of these fixtures to effectively and efficiently store their parts. A well-organized storeroom provides the maintenance department the support it needs to keep production machinery in the best possible operating condition. Parts are available, they can be located quickly, and they can be reordered in a timely manner. Repairs are made quickly and efficiently, and the company remains competitive and successful in the global economy.

About IMS

Frank Murphy, CPMM, is the Founder and President of Inventory Management Services Inc., of Greenville, SC. IMS’s “hands-dirty” consulting approach changes MRO-parts storerooms from a reactive practice to a proactive process.

IMS implements Best Practice and common-sense principles of storeroom design, storage fixture selection and setup, and parts consolidating and organizing. Drawing on 35 years of maintenance and storeroom experience, IMS provides all the “hands-dirty” services needed to set up a Lean and Reliable MRO parts storeroom: design, setup, relocation, consolidating and organizing, physical inventory, and bar-code labeling services for the implementation of Lean and Reliable MRO-parts storerooms and maintenance tool cribs.

Clients include Alcoa, Cognis, ConAgra, Domino Sugar, General Electric, Gillette, Kraft Foods, Miller Brewing, Pepsi, Proctor & Gamble, US Gypsum, and US Steel.

Frank is a Certified Plant Maintenance Manager (CPMM), has presented seminars at the NFMT & Lean Manufacturing Conferences, and has published articles for both trade journals and organizing websites.