



## **THE OPTIMUM LUBRICANT STORAGE FACILITY**

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Without lubrication, industry would grind to a halt! Fact! The cogs of industry rotate around a well-oiled operation, literally! Therefore, it would be fair to say that an oil store should be built/operated and maintained to the highest possible standards. Then why is it that most oil stores are often down in some dark and unused area of the plant that nobody else wants, or even out-doors? Why aren't they treated as the crucial hub to production, and accorded the every need they deserve?

If improving your oil store is not on your list of priorities, then it should be. This article is intended as a guide to the setting up of an efficient and well-organised oil store. The article addresses many of the minor issues, often overlooked, which as a whole form an important and crucial part to a good lubricant store. Whether you are a low level lubricant user, or a large plant, it is certainly hoped that some benefit will be gleaned from reading this.

When drawing up plans to revamp the oil store, it is important to plan from the beginning the amount of space necessary, the necessary furniture and benches, provision for storage, lighting, power and ventilation needs, and above all, to ensure the ergonomics of it all. By making the work area and procedures as simple and as painless as possible, it will encourage ownership and enthusiasm in the store, and ensure the lubrication management is done properly. Bearing in mind that several people may be involved in the storeroom, consistency in the procedures and housekeeping is critical to good management.

As with any chain, the weakest link can make or break the success of the exercise, so it is essential that the work area is set out properly, and, to avoid unwittingly contaminating stock, that good housekeeping is practised at all times. The storeroom will be a showcase, and if successful, the hub of an efficient operation, and should look presentable at all times. Visitors and colleagues should come away with the impression that an oil store is as sophisticated a work area as the IT operations.

Whether you run a small automotive workshop, or a large power station or open cast mine, an adequate storage area is necessary. For some, this may simply be an appropriate cupboard, for others, it may be bulk storage with pumped dispensing systems. What is common to both is the need to ensure the very basics of avoiding outdoor storage, providing adequate racking for the containers, providing suitable handling and dispensing systems, as well as disposal arrangements. More importantly, is the need to ensure compliance with Health and Safety regulations and ensuring that all members of staff are trained in fire fighting and spillage procedures. On the point of disposal and spillage, no organisation wants the stigma of an environmental disaster!

## **Addressing Health & Safety and Environmental Issues**

The work area is critical to the smooth operation of the service. The comfort of the oiler/lubricator is a concern given the somewhat hazardous nature of the store and the job. As with any job, giving ownership to the individual will ensure a keen interest in the job at hand, and this may mean the incumbent playing an active role in the design of the area. Apart from the comfort of the oiler, it is also important to ensure that the storeroom is maintained at a constant room temperature and is adequately ventilated. Given the nature of the oils and perhaps solvents stored in this area, ventilation is important to avoid the build up of lethal fumes that pose a fire and health risk. However, just as important, is the fact that to ensure maximum shelf life of the lubricants, the store should be maintained in a dry state to avoid contaminating the oil with the ingress of moisture. It is worth requesting a Materials Safety Data Sheet for each lubricant to keep in the storeroom in case of a query, and, more importantly, for the oiler to check before handling the lubricant.

The ergonomics of the layout should be considered, but as each operation has its own unique circumstances with respect to lubricant types and consumption, this will partly come with time, and can be improved accordingly. In addition to the obvious shelving or racking for the storage of containers, there should be a workbench at the appropriate height with sufficient work surface to allow for the maintenance of dispensing and handling tools. Single and 3 phase power points should be provided accordingly for any power tools or filter carts, and in some instances, an airline might be required.

Obviously, warning signs will be required to highlight the danger of the fluids in these containers, and it goes without saying that smoking and eating should be prohibited in this area. Work by the ISO working group will improve the situation with regard to the labelling of lubricants, providing a more consistent and global system. Still on safety, fire extinguisher equipment should be available, although the type of lubricants stored will dictate exactly what form is required, and as mentioned already, appropriate training should be given to all staff in the correct handling of these units. A first aid kit and eye wash solution should also be kept on hand, and training given to the staff on its use. If possible, a small sink unit and hot and cold water should be made available with a good quality hand wash available. In addition to the company policy on hard hats and safety shoes, safety gloves and eye protection should be available for use at all times when working out in the plant. Any safety charts with explanations of warning symbols or procedures 'in the event of' should be displayed around the store.

Non-slip flooring should be laid for safety reasons, but as well as being impervious to oil spillage will allow easier mopping up. A concrete floor will look unsightly after a period, and is difficult to sweep, and could contribute to airborne contaminant. Likewise, the walls should be painted or tiled to minimise cleaning and dust release.

With regard to environmental issues, most companies now participate in ISO 14001 and have access to an expert in these matters regarding their lubricant types and local conditions or circumstances. The oil store must comply with all local and national laws with regard to protection of the environment, and may even contribute to the metrics used in attaining and maintaining the organisation's 'green' status. Therefore, space for disposal of used oils must be considered, whether storing them for removal by a contractor or for reclamation on site. It is also important to consider any drains that may run under or near the oil store, since in the event of a spill occurring possible contamination of local water sources may occur. Hence, special drainage may be required within the storeroom to avoid this. Special containment sacks should be available at all times to prevent a spillage seeping into drains and should be placed not just in the storeroom but around the site. The environmental officer will be able to identify critical areas where this might be an issue.

The use of appropriate signs on the containers and piping used to dispense oil should be adequate and well placed and any individual required to work with these or maintain the distribution systems should be familiar with the conventions. Training, work instruction sheets and signage are crucial, urban legends abound about the technician incorrectly piping up an oil cooler and flooding the water supply with lubricant!

### **Dispensing Systems**

Depending on the nature of the business, a simple cupboard may suffice for the storage of the small 25L containers. As already mentioned, this should be adequately ventilated with a fire extinguisher to hand and the relevant Materials Safety Data Sheets information available. Even in this simple scenario, it is important to ensure this is indoors, and protected against airborne contaminants such as dust and moisture. Stock rotation is just as crucial at this level, as is inventory control. Too little stock and machines may go low on lubrication. Too much stock and the lubricant may be beyond its useful life before it reaches the machine. However, some sort of dispensing jug will be required to get the lubricant into the system, and no, coffee tins are not suitable. Proper oilcans such as supplied by Oil Safe are designed to ensure the exclusion of extraneous contaminant, and have spouts that ensure the oil reaches inside the machine and not outside. Whilst the human eye may not see any contaminant, and thus assume that new oil is clean oil, particles of silica from the dust in the atmosphere or from production activities can have a serious impact on the wear rates of the equipment.

In a larger operation, the use of 210L containers is often the norm. For this arrangement, indoor storage is again crucial, and the racking should allow for the barrels to be stored on their sides with the bungs at 3 and 9 o' clock positions to ensure that there is an airtight seal. Outdoor storage is not recommended since water accumulates on the top of the barrel and this can lead to corrosion of the barrel and ingress in the oil, causing lubricant damage. Trolleys should be available for moving the barrels from the delivery point to the racking and, where several tiers of racking are used, appropriate equipment should be available for lifting the barrels to the higher levels. Some oilers prefer to dispense manageable amounts from these barrels into smaller 25L containers, and the comments in the chapter above apply. However, some sites require the 210L barrel be taken to the filling point, and appropriate handling equipment must be available, since these barrels are in excess of 200kg when full. Whilst the most common method of dispensing oil out of the barrel is to use a hand crank, this allows contaminant in the barrel to be dispensed into the system. More proactive organisations now use a filter cart, which may be capable of both carrying the barrel and pumping and filtering the oil, as it is needed. These are recommended where it is necessary to dispense from the barrel directly into either a smaller container or the machine. The use of the barrels should be restricted to one type of oil to avoid cross contamination, particularly where the barrel is replenished on a regular basis from a bulk store. Caution is advised when standing a barrel at any time, it is not unknown, given the weight of a full barrel, for a sharp object, such as a nut or stone, to pierce the bottom of the barrel thus causing spillage.

Where a site is fortunate enough to have a high throughput of a few lubricant types, then the ultimate oil store is a bulk container area with distribution piping to the required areas. Several points have to be considered here. Firstly the ideal location on the site, bearing in mind the need for tankers to have access to fill these, the piping demands to the points of need, power for the pumping units, the security of the site and access for fire fighting tenders to reach the area, and the proximity to environmental danger zones. The bulk containers may be permanent with a tanker replenishing the lubricant, or, the container may be portable in the sense that it can be delivered, hooked up, used and then taken away for refill. If a suitable roofing structure cannot be provided to keep rain off the containers, then the containers should be designed to avoid containment of water on the tops of the containers, preferably these should be designed with domed tops. In addition, whatever the structure, the containers will need good quality desiccant breathers to avoid the ingress of dust and moisture. Sight

glasses or level gauges will be required to monitor re-order needs, as well as sampling points so that analysis can be undertaken at regular intervals to ensure quality of the stored lubricant. Provision should also be made for cleaning of the containers at regular intervals, and again, it is necessary to restrict the use of the container to one lubricant type. The area will require adequate drainage for catchment of spillage or leakage, and environmental concerns must be considered. Where rainwater may drain from this area, it may be necessary to provide separate drainage as this water could be contaminated by lubricants. Ideally, the pumping station and dispensing points should also include filtration units to ensure clean delivery of the oil to the system, and may include flow meters for the management of the lubricant consumption in each area. A typical example of where this system may be used is in a mining environment where demands for lubricant are as diverse as the haul truck service area to the maintenance workshops.

### **Lubrication Technicians and the Digital Age**

Many organisations now operate complex data management systems and there is no reason why the oil store should not link with this. Whether it is the issuing of daily work instruction sheets, or the logging of top-up volumes for each system, or the stock and inventory control of the lubricants, there is a definite need for the oil store to link with the network. Whilst a computer may not be essential in the oil store, the use of handheld units is a definite need for the oiler as suggested above, with the provision for the synchronisation of data between the unit and the network. Where an organisation operates an oil analysis programme, this information is crucial to the success of that, although more importantly, the financial benefits of knowing exactly how much lubricant is being used where is key to improving on that.

### **Conclusion**

It is hoped that this article gives some insight into the optimum oil store, and gives some idea of the additional costs involved in setting one up. Obviously, not all of the above is relevant to a basic operation, but health and safety issues are important whenever oil is handled. It is important to work with the company's Environmental and Health & Safety Officer to ensure compliance with the policies. In fact, part of the measurable benefits of maintaining the optimum oil store is the reduction of lubricant consumption and leakage, so it is important to involve these departments in gaining their support.

Lastly, as already mentioned, several people may be involved, so it is important to write up the rules of house keeping and ensure these procedures are applied at all times to ensure a successful oil store.