



# *Oil and Gas Regulatory Authority*

## *TECHNICAL STANDARD*

### *FOR*

## *LUBE BLENDING, RECLAMATION, GREASE AND*

## *TRANSFORMER OIL PLANT*

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## 1 **Short title and Commencement.-**

1.1 These Regulations may be called the Technical Standards for Lube Blending, Reclamation, Grease and Transformer Oil Plants

1.2 They shall, come into force at once.

2 **Applicability.-** These regulations shall be applicable to all industrial plants where Base Oil/used lubricating oil is blended or reclaimed for the purpose of manufacturing different grades of lubricating oils/ lubricating oil base stock/ grease/transformer oil.

## **Chapter - I** **(General)**

### 3 **Scope of this Standard**

3.1 These Standards prescribe the technical standards relating to the lay out, construction, material and storage of lube oil blending, reclamation, grease and transformer oil plants, and also includes piping, pumps, blending kettles, HSE, safe operations, fire fighting systems and handling of finished products.

3.2 All existing Lube Blending, Reclamation, Grease and Transformer Oil Plants shall be up-graded to conform with the requirements of these Standards within 05 years from the date on which these Standards are made effective. These Standards shall however be applicable to all new Lube Blending, Reclamation, Grease and Transformer Oil Plants those established after the date on which these Standards are made effective.

3.3 These standards do not apply for storage of petroleum products other than base oil, lubricating oil, lubricating oil base stock, grease and transformer oil.

### 4 **Glossary.-**

4.1 In these regulations, the following terms shall be defined as follows:

(i) “adulterate” means to produce, prepare, mix or blend any petroleum product with any other substance which reduces its quality below the required specifications and the terms ‘adulteration’ and ‘adulterated’ shall be construed accordingly;

(ii) “EPA” means the Pakistan Environmental Protection Agency established under the Pakistan Environmental Protection Act, 1997(xxxiv of 1997);

(iii) “blending” includes the activity of blending of lubricating base oils, lubricating oils or greases of the same or different kinds or grades with additives, to produce lubricants or greases, as the case may be, provided that the blending of petroleum products other than lubricating base oils, lubricating oils or greases shall not constitute the activity of blending under the Ordinance or rules, provided further that the mixing or blending or dosing or additizing of fuels shall not constitute blending;

(iv) “blending plant” means an oil blending facility where oil blending is carried out and includes all other facilities and equipment used for the purpose;

(v) Classification of Liquids

Any liquid within the scope of this standard and subject to the requirements of this standard shall be known generally either as a flammable liquid or as a combustible liquid, and shall be defined and classified in accordance with this subsection.

a. Flammable Liquid

Any liquid that has a closed-cup flash point below 100°F (37.8°C), as determined by the test procedures and apparatus as in ASTM D 56, Standard Method of Test for Flash Point by the Tag Closed Cup Tester, ASTM D 93, Standard Test Method for Flash Point by the Pensky Martens

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Closed Tester, ASTM D 3278, Standard Method for Flash Point by Setaflash Closed Tester and ASTM D 3828, Standard Test for Flash Point by Small Scale Closed Tester. Flammable liquids shall comprise of Class I, that is, any liquid that has a closed-cup flash point below 100°F (37.8°C) and a Reid vapour pressure not exceeding 40 psia (2068.6 mm Hg) at 100°F (37.8°C), and includes:

Class IA liquids:

Liquids that have flash points below 73°F (22.8°C) and boiling points below 100°F (37.8°C).

Class IB liquids:

Liquids that have flash points below 73°F (22.8°C) and boiling points at or above 100°F (37.8°C).

Class IC liquids:

Liquids that have flash points at or above 73°F (22.8°C), but below 100°F (37.8°C).

b. Combustible Liquid

Any liquid that has a closed-cup flash point at or above 100°F (37.8°C) as determined by the test procedures set forth in ASTM D 56, Standard Method of Test for Flash Point by the Tag Closed Cup Tester, ASTM D 93, Standard Test Method for Flash Point by the Pensky Martens Closed Tester, ASTM D 3278, Standard Method for Flash Point by Setaflash Closed Tester and ASTM D 3828, Standard Test for Flash Point by Small Scale Closed Tester. Combustible liquids shall comprise of Class-II and Class-III liquids, that is:

Class-II liquid:

Liquids that have flash points at or above 100°F (37.8°C) and below 140°F (60°C).

Class-IIIA liquid:

Liquids that have flash points at or above 140°F (60°C), but below 200°F (93°C).

Class-IIIB liquid:

Liquids that have flash points at or above 200°F (93°C).

(vi) “Finished Product” means blended lubricants and lubricant base stock.

(vii) “grease plant” means a petroleum grease manufacturing plant licensed under the rules for the purpose of production of various grades of grease;

(viii) “Local Government“ means the local government as defined under the relevant Provincial Local Government Ordinance, 2001;

(ix) “lubricant” means finished lubricating oils or greases of laid down specifications produced locally or imported;

(x) “NEQS” means National Environmental Quality Standards as prescribed by Pakistan Environmental Protection Agency (PEPA);

(xi) “Ordinance” means the Oil and Gas Regulatory Authority Ordinance, 2002 (XVII of 2002);

(xii) “petroleum products” includes refined oil products, lubricating oils and greases excluding LPG;

(xiii) “reclamation plant” means a licensed facility engaged in the reclamation , refining or processing of used lubricating oils including

transformer oil and turbine oil by any method whatsoever towards the completion of a lubricating oil base stock;

(xiv) “sample” includes specimen or a quantity of petroleum product, taken or obtained or collected by a person, authorized by the Authority, for inspection, testing or examination as evidence of the quality, quantity, composition or weight of the said product; provided that, in the case of a refinery or blending plant, samples shall be taken only of petroleum products which are ready for sale and supply to customers and in respect of which a certificate of quality has been issued by such refinery or blending plant;

(xv) “specifications” means standards and the specifications for petroleum products which the Federal Government may issue as policy guidelines under the Ordinance;

(xvi) “substandard petroleum product” means a petroleum product which, in relation to its composition or quality, falls below the required specifications;

(xvii) “technical standards” means the standards prescribed by the Authority under the Ordinance, in relation to any regulated activity;

(xviii) “Technical Standard Compliance Report” means the technical audit report issued by third party inspector, as prescribed by the Authority, certifying that the blending plant/ reclamation plant/ grease plant, as the case may be, are in compliance with the technical standards;

(xix) “third party inspector” means local or international company appointed by the Authority as third party inspector, having a minimum ten years experience in carrying out inspection of relevant regulated activity for the midstream and downstream oil sector, for certification of technical standards specified by the Authority

(xx) “used lubricating oil” means lubricating oil drained from automotives, industrial machinery, transformer or turbine and includes all types of discarded or waste lubricating and other oils.

4.2 In this standard the following international Standards and Codes have been referred to and apply as mentioned:

API 500	Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2
API 600	Steel Gate Valves - Flanged and Butt-welding Ends, Bolted Bonnets
API 617	Axial and Centrifugal Compressors and Expander-compressors for Petroleum, Chemical and Gas Industry Services
API 650	Welded Steel Tanks for Oil Storage.
API Std 653	Tank Inspection, Repair, Alteration, and Reconstruction
API Std 674	Positive Displacement Pumps - Reciprocating
API Std 675	Positive Displacement Pumps - Controlled Volume
API Std 676	Positive Displacement Pumps-Rotary
API Std 1104	Welding of Pipeline and Related Facilities
API Std 2610	Design, Construction, Operation, Maintenance, and Inspection of Terminal & Tank Facilities

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ASME B31.1	Power Piping and Process Piping
ASME B31.3	Process Piping
ASME B31.4	Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids
BS 7430	Code of practice for earthing
NFPA-10	Standard for Portable Fire.
NFPA 12	Standard on Carbon Dioxide Extinguishing Systems
NFPA 14	Standard for the Installation of Standpipe, Private Hydrant, and Hose Systems
NFPA 16	Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems,
NFPA 30	Flammable and Combustible Code
NFPA 70	National Electrical Code (NEC),
NFPA 780	Standard for the Installation of Lightning Protection Systems
NEMA-MG1	Information Guide for General Purpose Industrial AC Small and Medium Squirrel-Cage Induction Motor Standards
BS EN 60947-2	Specification for low-voltage switchgear and controlgear. Circuit-breakers
AWS D1.1	Structural Welding Code

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ASME Sec II	ASME Boiler & Pressure Vessel Code - Section II - Materials
ASME Sec VIII	ASME Boiler & Pressure Vessel Code - Section VIII - Pressure Vessels
ASME Sec IX	ASME Boiler and Pressure Vessel Code, Section IX: Welding and Brazing Qualifications
ISO 9001	Quality Management Systems -- Requirements
ISO 14000	Environmental Management
SRO No. 624 dated July 2, 09	Technical Standards for Petroleum Industry (Depots for Storage of Petroleum Products)

## **Chapter - II** **(Site Requirements)**

### **5 Site Selection**

A site selection criterion should be established that minimizes the potential risk to property adjacent to the plant facility and the risk present to the plant by an incident on the adjacent property. Following factors should be considered when selecting a site for a new plant:

- (i) Proximity to public ways
- (ii) Proximity to waterways and other surface waters
- (iii) Risk to and from adjacent facilities
- (iv) Types and quantities of products to be stored
- (v) Proximity to populated areas

- (vi) Assessment of site environmental conditions including soil and groundwater conditions, such as depth of the water table and type of aquifer.
- (vii) Availability of off-site emergency services and access for emergency response
- (viii) Location and availability of required utilities including electricity, sewer, potable water, fire water, steam, air and natural gas.
- (ix) Requirements for receipt and shipment of products including the road, rail etc.

## 6 Protective Boundaries

The Installation/ depot shall be protected on all sides by concrete/ brick wall having a minimum height of 7 ft (2.1m). The wall may also have barbed wire fencing on the top.

## Chapter - III (Off-Site Requirements)

### 7 Road System

7.1 The roads should have minimum width of 10ft (3m) to permit easy maneuvering of vehicles, with corner radii to suit the turning circle of the largest vehicle (i.e. fire trucks, product tank trucks or any specialist vehicles carrying special loads applicable to the plant

7.2 There should be adequate parking for vehicles to load or unload, and clearance to enter or leave the site.

7.3 Parking of all vehicles shall be faced to main gate. Front end (Driver end) of tank truck shall be faced to main exit so that in case of any emergency, vehicle shall drive out of the installation.

## **8 Unloading System for Base Oil/ Used Oil**

8.1 For base oil unloading, the required area may consist of the platform and associated equipment, plus the area for parking the tankers. Also adequate parking space may be provided for vehicles waiting to be unloaded.

8.2 An unloading facility shall preferably have the canopy or roof that does not limit the dissipation of heat or dispersion of flammable vapors and also does not restrict fire-fighting access and control.

8.3 Suitable metering equipment shall be used for measuring the quantity of base oil/ used oil received and to be decanted.

8.4 The loading unloading points may be so arranged that vehicles enter from one side and leave from the other without any need for reversing/ repositioning.

8.5 Un-loading area should be fully paved, curbed and drained so that spills, if any, from trucks and equipment would flow quickly to adequately sized and suitably located catch pits and drains. Pavement should include raised edge (curbing) designed as sloped and rounded to facilitate truck access.

8.6 Catch basins should be located so that the liquid will flow away from tank truck, un-loading area.

8.7 Un-loading facilities, if required, shall be provided with a means for electrically bonding to protect against static electricity hazards.

## **Chapter - IV** **(Storage Tanks)**

### **9 Storage Tank:**

9.1 Atmospheric tanks, including those incorporating secondary containment, shall be designed and constructed in accordance with recognized engineering standards or approved equivalents such as API Standard 650 and Welded according to ASME Section IX

9.2 The materials of construction for tanks and their appurtenances shall be compatible with the liquid to be stored. If the properties of the liquid to be stored are not clear, the supplier or producer of the liquid shall be consulted.

9.4 Tank and their structural attachments shall be welded by the shielded metal-arc, gas metal-arc, gas tungsten-arc, oxyfuel, flux-cored arc, submerged-arc, electroslag, or electrogas process using suitable equipment.

9.5 Welding may be performed manually, automatically, or semi automatically according to the procedures described in relevant Codes such as ASME Section IX.

## 10 Requirements for Platforms and Walkways

Plat forms or walkways used for walking between tanks, kettles or any other application shall comply with the following requirements:

- (i) All parts shall be made of metal
- (ii) The minimum width of the floor level shall be 24 inches
- (iii) Flooring shall be made of grating or non-slip material
- (iv) The height of the top railing above the floor shall be 42 inches
- (v) The minimum height of the toe board shall be 3 inches
- (vi) The maximum space between the top of the floor and the bottom of the toe board shall be  $\frac{1}{4}$  inch
- (vii) A tank runway that extends from one part of a tank to any part of an adjacent tank, to the ground, or to another structure shall be supported so that free relative movement of the structures joined by the runway is permitted. This may be accomplished by firm attachment of the runway to one tank and the use of a slop joint at the point of contact between the runway and the other tank.

## 11 Shell to Shell Spacing Between Two Adjacent Aboveground Tanks

11.1 As per definition in regulation 4.1(v) above, base oil/used lube oil are combustible liquid may fall under the category of Class II and III depending upon its properties. Tanks storing Class II or Class III stable liquid shall be separated by the distances given in Table 1.

**Table 1 – Minimum Tank Spacing (Shell to Shell)**

(1ft=0.3048m)

Sr. #	Tank Size	Floating Roof Tanks	Fixed or Horizontal Tanks	
			Class I or Class II Liquids	Class IIIA Liquids
1	All tanks not over 150 ft in diameter	1/6 x sum of adjacent tank diameters but not less than 3 ft	1/6 x sum of adjacent tank diameters but not less than 3 ft	1/6 x sum of adjacent tank diameters but not less than 3 ft
2	Tanks larger than 150 ft in diameter			
a)	If remote impounding provided in accordance with note 1 below	1/6 x sum of adjacent tank diameters	1/4 x sum of adjacent tank diameters	1/6 x sum of adjacent tank diameters
b)	If diking is provided in accordance with note 2 below	1/4 x sum of adjacent tank diameters	1/3 x sum of adjacent tank diameters	1/4 x sum of adjacent tank diameters

Note 1: See regulation 12.2 below

Note 2: See regulation 12.1 below

11.2 Tanks used only for storing Class IIIB liquids need not be separated by more than 0.9m (3ft) provided they are not within the same diked area as, or within the drainage path of, a tank storing a Class I or Class II liquid.

## 12 Diking Requirements

Tank area shall be provided with means to prevent an accident release of liquid from endangering important facilities and adjoining property or from reaching waterways. Such means shall meet requirements as under:

12.1 Diking: The volumetric capacity of the diked area shall not be less than the greatest amount of liquid that can be released from the largest tank within the diked area, assuming a full tank. To allow for volume occupied by tanks, the capacity of the diked area enclosing more than one tank shall be calculated after deducting the volume of the tanks, other than the largest tank, below the height of the dike.

12.2 Remote Impounding. Where control of spillage is by means of drainage to a remote impounding area, so that impounded liquid will not be held against tanks, such systems shall comply with the following:

- a. A slope of not less than 1 percent away from the tank shall be provided for at least 15 m (50 ft) toward the impounding area.
- b. The impounding area shall have a capacity not less than that of the largest tank that can drain into it.

## **Chapter - V** **(Piping)**

### **13 Piping System**

The design, fabrication, assembly, test, and inspection of piping systems shall be suitable for the expected working pressures and structural stresses. Piping systems shall be maintained liquid tight. A piping system that has leaks constitute a hazard shall be emptied of liquid or repaired. Requirements for piping system are as under:

13.1 Pipe, valves, faucets, couplings, flexible connectors, fittings, and other pressure-containing parts shall meet the material specifications and pressure/temperature limitations of process.

13.2 Joints shall be made liquid tight and shall be welded, flanged, threaded, or mechanically attached. They shall be designed and installed so that the

mechanical strength of the joint will not be impaired if exposed to a heat/fire. Threaded joints shall be made with a suitable thread sealant or lubricant.

13.3 Piping systems shall be substantially supported and protected against physical damage and excessive stresses arising from settlement, vibration, expansion, or contraction. The installation of nonmetallic piping shall be in accordance with the manufacturer's instructions.

13.4 Welding may be according to the procedures described in relevant Codes such as API Standard 1104 and ASME 31.3.

13.5 Piping systems that are subject to external corrosion shall be suitably protected.

13.6 All piping shall be tested before being covered, enclosed, or placed in use. Testing shall be done hydrostatically to 150 percent of the maximum anticipated pressure of the system or pneumatically to 110 percent of the maximum anticipated pressure of the system, and the test pressure shall be maintained for a sufficient time to conduct a complete visual inspection of all joints and connections. In no case shall the test pressure be less than a gauge pressure of 35 KPa (5 psig) measured at the highest point of the system, and in no case shall the test pressure be maintained for less than 10 minutes.

## **Chapter - VI** **(Pumps)**

### **14 Pumps Requirements**

Positive displacement (PD) pumps are typically used in such facilities and when used shall conform to sound and good engineering practices. Requirements for pumps are as under:

14.1 Pump should be selected on performance specification, compatibility with the service application, durability, and anticipated maintenance requirements.

14.2 The pumps and motor selected should be reviewed to ensure that motor horsepower is adequate for all performance points over the entire range of operation, not just one design point.

14.3 Piping systems at pump locations should be designed to allow for pump removal and maintenance. At locations with multiple pumps, each pump should have isolation valves and check valves.

14.4 PD Pumps, when installed, should utilize a pressure relief system and may require pulsation dampeners.

14.5 The piping system should be designed to prevent binding, misalignment, and seal wear on the pump as well as to avoid structural limitations of the pump casing.

14.6 Motor installed with a pump, shall be of a class compatible with the environment.

14.7 Drip and spill containment around the pump shall be avoided.

14.8 The operator should maintain a data file for each pump that should include pump make and model, motor make and model, flow rate, pressure rating etc.

## **Chapter - VII** **(Blending Kettles)**

### **15 Blending**

15.1 Contamination is the main concern of the lube-oil blender. Base Oil and additives are expensive and mis-blending or contamination of the final product may mean down-grading the product. To avoid contamination it is imperative that products are produced in closely related product family groups or entirely separately using different mixing tanks. Subsequent flushing is also essential tool to combat contamination.

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15.2 Kettles shall be designed and built in accordance with recognized engineering standards for the material of construction being used. Tanks shall be of steel or other approved noncombustible material

15.3 The materials of construction for kettle and its appurtenances shall be compatible with the blending ingredients. If the properties of the blending ingredients are not clear, the supplier or producer of the same shall be consulted.

15.4 Atmospheric tanks, including those incorporating secondary containment, shall be designed and constructed in accordance with recognized engineering standards or approved equivalents such as ASME Section VIII and welded in accordance with ASME Section IX.

15.5 Kettle and their structural attachments shall be welded by the shielded metal-arc, gas metal-arc, gas tungsten-arc, oxyfuel, flux-cored arc, submerged-arc, electroslag, or electrogas process using suitable equipment.

15.6 Necessary arrangement for adequate mixing/blending of components shall be made in accordance with good engineering practices. Such means may include the following but is not limited to:

- PD Pump and piping arrangement for blending (refer regulation 13 and 14) kettles
- Piping system to introduce clean air for mixing
- Internal baffles to create turbulence
- Appropriate mixer
- Heating arrangement
- Temperature sensor
- Metering system for raw material and chemicals injection

- Proper Instrumentation

## **Chapter - VIII** **(Safe Operation of Facilities)**

### **16 Safe Operation**

Safe operation of facility is a management responsibility. Management programs shall be established to assure conformance with the following:

- applicable safety and operational standards,
- compliance with applicable regulations,
- and the use of appropriate work practices and procedures.

### **17 Steps for Safe Operation:**

Elements most often used/required in the safe operations are as follows:

17.1 Hazard Identification Programs shall be established and be in effect. Information on safety hazards shall be available to facilitate communication with employees, contractors, subcontractors etc. Hazard Identification Information provided shall include

17.1.1 Right-to-Know requirements and provision of ready access to Material Safety Data Sheets (MSDS) of chemicals/ ingredients used.

17.1.2 Hazard Identification Program shall include operational hazards, specific equipment hazards, and other hazards which may cause personal injury, environmental impact or property damage.

17.2 Written operating procedures shall be developed to address the routine and non-routine activities. These procedures shall *interalia* include product storage, handling and transfer.

17.3 A written emergency response plan and procedures shall be in place for each facility which should include contact numbers of Fire Brigade, Police Station and nearest Hospital/ Medical Facility.

17.4 First aid medical treatment must be available, and response for major medical situations should be planned in advance.

17.5 Emergency response procedures shall be established such as spills, fires, and abnormal conditions involving flammable and combustible materials.

17.6 All employees and contractor personnel working at plants shall receive appropriate training relevant to their duties as required by the applicable regulations

17.7 Incidents should be investigated and the findings made available for use in prevention of potential hazards.

17.8 Flooring of the plant shall be non-slippery.

17.9 Ensure good house keeping practices.

## **Chapter - IX** **(HSE Requirements)**

### **18 Health**

Following precautions shall be ensured at plant site:

18.1 Smoking shall only be permitted at specified areas

18.2 For plants required to be operative on a 24 hour basis, sufficient personnel shall be allocated to the Works to ensure work time for each person does not exceed to impart health hazard. Potable water shall be available for all workers.

18.3 Personal Protective Equipments (PPE's): Management shall provide appropriate PPE's as per job requirements, which shall comprise of following:

- Coverall / Dangri
- Safety Helmets
- Safety Gloves (preferably Neoprene)
- Safety Shoes
- Safety goggles
- Ear Muffs
- Mask
- Safety belt/ Harness

## **19 Safety**

19.1 Fire Prevention: Following measures shall be taken for prevention of potential fire:

19.1.1 There is potential for fire or explosion whenever flammable vapor-air mixture exists. Efficient measures shall be taken to avoid presence of such mixture.

19.1.2 Where flammable vapor-air mixture may not be eliminated, source of ignition must be controlled.

19.1.3 Maintaining the integrity of storage tanks and piping systems containing flammable or combustible liquids is essential to prevent fires in and around tanks and facilities.

19.1.4 Diked area and the area around storage tanks shall be kept clean of combustible materials that potentially could be a source of fire exposure to the tank

## **19.2 Fire Fighting Equipment**

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Although fires in such facilities are rare, however presence and use of fire extinguishing equipment is essential as preventive measures. All facilities shall have portable fire extinguishers available at or near areas where fires may occur. Extinguishers shall be of suitable class and of an appropriate size for the nature of fire that might occur. For more details refer NFPA 10.

### 19.3 Fire Fighting Water-System

In a hydrocarbon processing and handling facility, the capacity and extent of the fire fighting equipment to be provided is based on the assumption that only one major fire will occur at any one time. Thus the requirements of the largest single fire possibility shall govern the design of the major fire fighting facilities.

Fire prevention water may be from any source that is capable of providing the required flow rate, at the necessary pressure, and for sufficient duration to either extinguish the largest expected fire or allow it to safely burn out by providing for cooling of exposed equipment tanks. Such source may include utility water system, public water supplies, dedicated in-plant fire protection water supplies, such as fire water ponds and water tanks or nearby natural water sources, such as river, lakes and ponds.

### 19.4 Water Capacity and Fire Pump Flow Rates

The total water capacity and fire pump flow rate for extinguishing the major fire must be adequate for the highest combination of both the foam making requirements and the cooling of tanks or other structures and it shall depend upon the capacity of the facilities to be protected

### 19.5 Size of Fire Mains

Fire mains shall be of ample size, in no case smaller than 6 in. (152 mm).

### 19.6 Hydrants

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Fire main shall be provided with a suitable number of hydrants spaced at appropriate distances and sized to give adequate cover to the appropriate area or process unit. Hydrants shall be sited in accessible positions. A typical spacing is 50-100 m, giving maximum hose lengths from hydrant to nozzle of 30-50 m.

#### 19.7 Height of Hose Outlet

The centre of a hose outlet shall not be less than 18 in. (457 mm) above final grade, or when located in a hose house, 12 in. (305 mm) above the floor.

#### 19.8 Electrical Equipment Fires

In general, water and foams should not be used on fires involving live electrical equipment. For such applications, electrically non-conductive media including carbon dioxide and dry chemical powders shall be used.

#### 19.9 Foam System

If required Trolley Mounted Foam can also be used for extinguishing the fire.

#### 19.10 Safety Signs

For safety of the workers appropriate Safety Signs shall be displayed at peculiar points.

### **20 Environment**

The company shall take all necessary steps for protection environment to meet NEQS prescribed by Pakistan Environment Protection Department (PEPA) from time to time. Steps involved for protection of environment are as follows, but is not limited to:

20.1 Equip base oil/ additives tanks with level gauges to indicate level and prevent product over flow that may affect the environment;

20.2 Cover all tanks with Dike wall (refer [regulation 12 above](#)) to contain the contents of the tank in case of any product over flow/ spill;

20.3 Connect dike walls with drainage system and oils (in case of oil spill) and process it for separation of oil from water, such as API Separators (refer [regulation 20.14 below](#));

20.4 Arrange proper ventilation arrangement in Blending and Filling areas to enhance better work environment;

20.5 Use of environment friendly fuel to aim Zero operation related emissions;

20.6 Arrangement/ availability of PPE's for staff to make their working environment and job more safe and comfortable (refer [regulation 18.3 above](#));

20.7 Encourage staff to participate in HSE initiative for improvement;

20.8 Plantation around boundary wall of plant and land escaping with flowering may be carried out for better environment;

20.9 For soil protection, soak pit may be constructed for toilet waste and containment in different exposed areas like base oil storage, unloading and production areas.

20.10 Use of Sorbet kits to be encouraged to handle oil spills and drum leakages etc in production floor and laboratories;

20.11 Waste Oil shall be collected and recorded separately in marked drums/ containers. Action shall be taken to dispose off in environment friendly manner;

20.12 Although there is no use of water in any processes however for handling of oil rain water means shall be established to separation of water and oil such as API Separator;

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## 20.13 Effluent;

### 20.13.1 Effluent Discharge

Effluent Discharge Oily-Water runs in closed sewers wherever possible. Gravity sewers should have adequate gradient for self-cleaning.

### 20.13.2 Collection of Oily Water

Effluent i.e. oily water runs through the entire operations area covering tank farms, un-loading facilities, pump house, packing area etc.

### 20.13.3 Treatment of Oily Water

All the oily water mixture shall preferably be collected at a single location and processed through a suitable system before discharging the same through any means to meet requirements specified in NEQS.

### 20.13.4 Drainage of Diked Area

Diked area must be graded so as to avoid collection of rain water. All gravity flow is directed towards the catch basin. Coming from the catch basin a line (minimum size 6 inch dia.) is routed through the dike to a block valve which is normally closed. This valve discharges to the storm drain system. The valve is kept closed to contain the oil within the diked area in case of tank leak/rupture. Operator must ensure that oil or any oil traces shall not go to storm water drain. If oil or oil traces are present in the drain, it must go to oil/water separator for treatment.

## 20.14 Waste

Combustible waste material in operating areas shall be kept to a minimum, stored in covered metal containers and disposed of at proper location as soon as possible.

## 20.15 Noise

Noise level at plant area shall be within prescribed NEQS i.e. 85dbs. For specific grinding jobs etc., if required, ear muff/plugs to be used.

## **Chapter - X** **(Handling of Finished Products)**

### **21 General:**

Finished Products are usually not hazardous products, however, care must be taken while handling, storing and dispensing lubricants. Unsatisfactory storage or careless handling of Finished Products may lead to leakage or contamination. Following care must be taken to ensure safe handling:

21.1 Management of Store to be based on logic of "First In-First Out".

21.2 A Material Safety Data Sheet (MSDS) may be provided for each product. It gives hygiene and safety instructions about handling, storing and dispensing.

21.3 Inhalation, contact with the skin, contact with the eyes, ingestion and aspiration must be avoided

21.4 Plastic packs/ Tins shall be properly sealed. Shrink plastic wraps may be used for extra protection. Pack/tin/drum shall be marked for batch number and date of manufacturing. A sample of each shall be maintained for six months to track quality related complaints, if any.

21.5 Finished Product drums, loading/unloading may be optimised with the use of a dock or a platform. If no dock is available, drums to slide lengthwise down a ramp

21.6 Avoid drum drops from truck bed and drum roll to protect seal. Drum hand truck may be used for long distances.

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## **22 Storage:**

Storage shall include the followings requirements, but is not limited to:

- i) Store shall have proper light and ventilation
- ii) Store shall be free of dust, water and contaminant
- iii) Avoid long storage of container on floor
- iv) Grease drums to be stored free from vibration, vertically in a well ventilated building
- v) Finished Products preferably be protected against direct sunlight

## **23 Storage in drums:**

23.1 Indoor storage of drums can be stacked horizontal or vertical.

23.2 Outdoor storage of drums in pyramid is appropriate providing proper blocks are used. Blocks may be of curved shape metals blocks or wooden block.

23.3 An alternate for outside storage of drums is on racks with protecting shed.

23.4 If stored horizontal, drums shall be placed in such a way that oil covers the seals/bungs. Seals/bungs should be horizontal to avoid penetration of air and water condensation into the drums

23.5 Water around bungs shall be avoided since it may draw into the drums.

## **24 Storage of Pails:**

In order to avoid damage of cartons when stacking, use heavy duty pallets with full board on the two sides so that cartons lay on a plain surface. Cartons shall not be over stacked to avoid crushing of bottom cartons. For overlapping of two racks, more than 4 levels of cartons on each rack may be avoided. Similarly for single rack, more than six level be avoided

## **25 Protection during decanting:**

25.1 Make sure that all hoses and containers used for decanting of Finished Product are clean

25.2 Use specific hoses and containers for each type of Finished Product

25.3 Clean all hoses and containers between switching of different products.

25.4 Dispensing shall be supervised by trained personnel to avoid spillage

25.5 Oily or greasy surface have the unfortunate ability to collect atmospheric impurities such as dust, grit and dirt therefore care shall be taken for the following:

- Always replace seal/drum bungs when not decanting
- Wipe drum seals/bungs and the area around the seals/bungs before decanting
- Never leave spilled oil on drums (it may act as a dust catcher)
- All dispensing equipment shall be thoroughly cleaned before being used