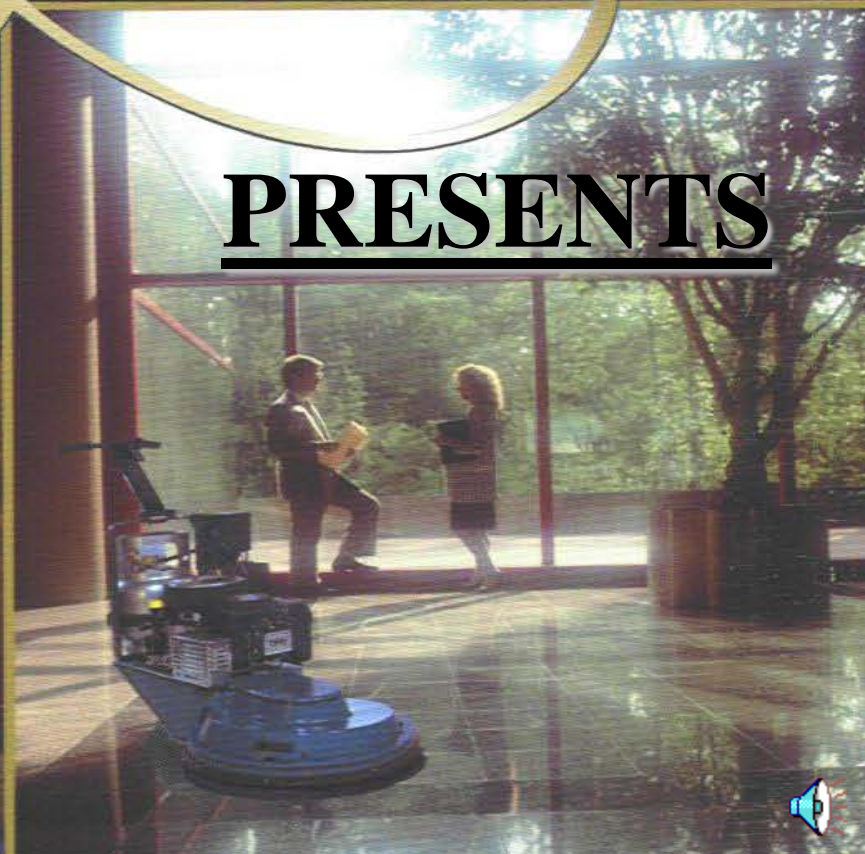


# Eagle<sup>TM</sup>

SOLUTIONS L.L.C.

**PRESENTS**





**The  
Propane Powered Machine  
Safety Awareness  
Workshop**





# **Propane Powered Engines**

**Propane Powered Engines are used on:**

- **Floor Maintenance Machines**
- **Small Generators**
- **Pressure Washers**
- **Power Trowels**



**For The Purpose of This  
Workshop We Will Be  
Concerned Only With Floor  
Machines Powered By Propane**





# Purpose Of This Workshop

- Inform Operators of established safe operating procedures
- Educate Operators, Managers and others of safe handling of propane

**NOTE: This is not a school to learn how to maintain floors!**

***• Safety is the motive behind this program***





# **Regulations, Codes, and Standards**

**Regulations Codes and Standards have been established for the protection of people and property.**

**Violations of some of these carry heavy fines.**

**The Agencies whose regulations effect our industry are:**

- **Occupational Safety and Health Administration (OSHA)**
- **National Fire Protection Association (NFPA)**
- **Environmental Protection Agency (EPA)**
- **Department of Transportation (DOT)**





# **Occupational Safety and Health Administration (OSHA)**

- **Federal agency responsible to set and enforce regulations effecting the working environment and practices of persons employed.**
- **A division of the US Department of Labor.**
- **Responsible for indoor air quality of the workplace**
- **Maintains a table of toxic materials (Z-1) and established “permissible Exposure Limits” (PEL) to toxic materials**
- **Has the authority to enforce their standards.**





# **National Fire Protection Association (NFPA)**

- **NFPA is a non-profit standard setting organization.**
- **It has no enforcement authority**
- **Most States and Federal Agencies adopt NFPA Standards as the base for their codes and regulations.**
- **NFPA #58 is the Standard for the storage and handling of Liquefied Petroleum Gases (propane)**
- **NFPA 58 8-4 is General provisions...including floor maintenance machines.**
- **NFPA 58 5 addresses the storage of portable containers. (fuel cylinders)**





# **Environmental Protection Agency (EPA)**


**EPA is a Federal Agency charged with the responsibility of protecting the environment from pollution of many sorts.**

**Air pollution is included**

**EPA also requires certification of engines sold in the US regarding emissions generated by the exhaust.**

**This certification has to be provided by the manufacturer whom installs the propane fuel system.**





# **Department of Transportation** **(DOT)**

- **Established regulations regarding the safety of fuel cylinders**
- **Regulations are included for the capacity and filling of the cylinders**
- **Regulations include safety criteria for pressure vessels.**
- **Regulations include the construction, transportation, and use of all these pressure vessels.**





# In This Program We Will

## Discuss:

- **Properties of Propane**
- **Propane cylinder and its components**
- **Proper filling of propane cylinders**
- **Transporting and storing fuel cylinders**
- **Installing fuel cylinders on the machine**
- **Operating the propane powered machine**
- **Routine maintenance of the machine**
- **Safety issues that need to be addresses**





# Properties Of Propane

- **Propane is a flammable gas**
- **Propane is liquefied by storing it in cylinders under pressure**
- **When pressure is released it becomes flammable vapor**
- **As a liquid propane is highly concentrated.**
- **The boiling point of liquefied propane is -44 degrees f.**





# Properties Of Propane

- **Propane is heavier than air**
- **Propane has no natural odor**
- **Propane used as fuel in engines produce toxic emissions**



# Propane Fuel Cylinders



**DOT 4E240 Propane Fuel Cylinder**





# Propane Fuel Cylinders

**Propane fuel cylinders are obviously a critical part of the floor machine.**

**Though fire related incidents are few, nearly 100% of them are in some way connected to fuel cylinders being overfilled!**

**Please give careful consideration to the following points.**

- **Propane cylinders should never be overfilled**
- **Overfilled cylinders can be identified by opening the fixed liquid level gauge.**
- **Always check cylinders for overfill before taking them inside!**

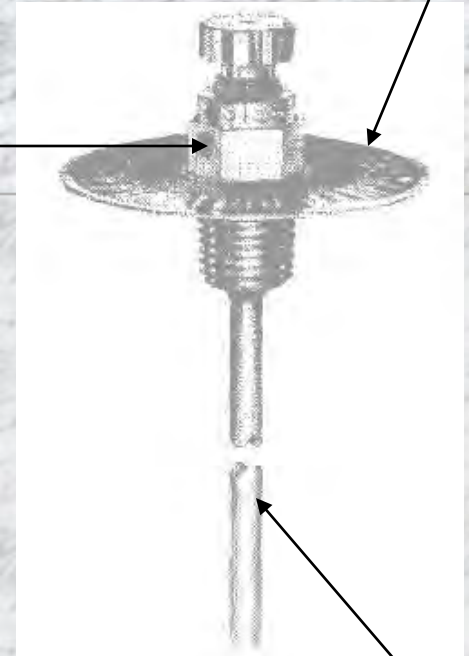




## • Fixed Liquid Level Gauge



Stop filling when liquid appears



Dip Tube



# Propane Fuel Cylinders

*Lets take a closer look at the top of the fuel cylinder*

• Service valve



# Propane Fuel Cylinders

*Lets take a closer look at the top of the fuel cylinder*



• Pressure Relief Valve



# Propane Fuel Cylinders

*Lets take a closer look at the top of the fuel cylinder*

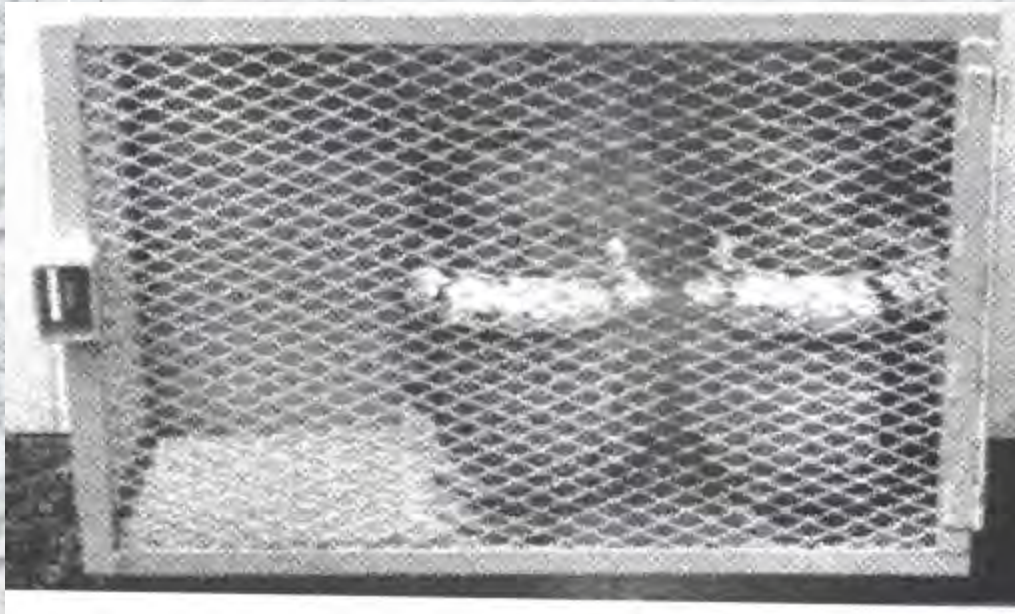


•Liquid Level Sight Gauge



# Propane Fuel Cylinders

## Outside Storage Racks



**Vertical Storage Rack**



**Horizontal Storage Rack**





# Propane Fuel Cylinders

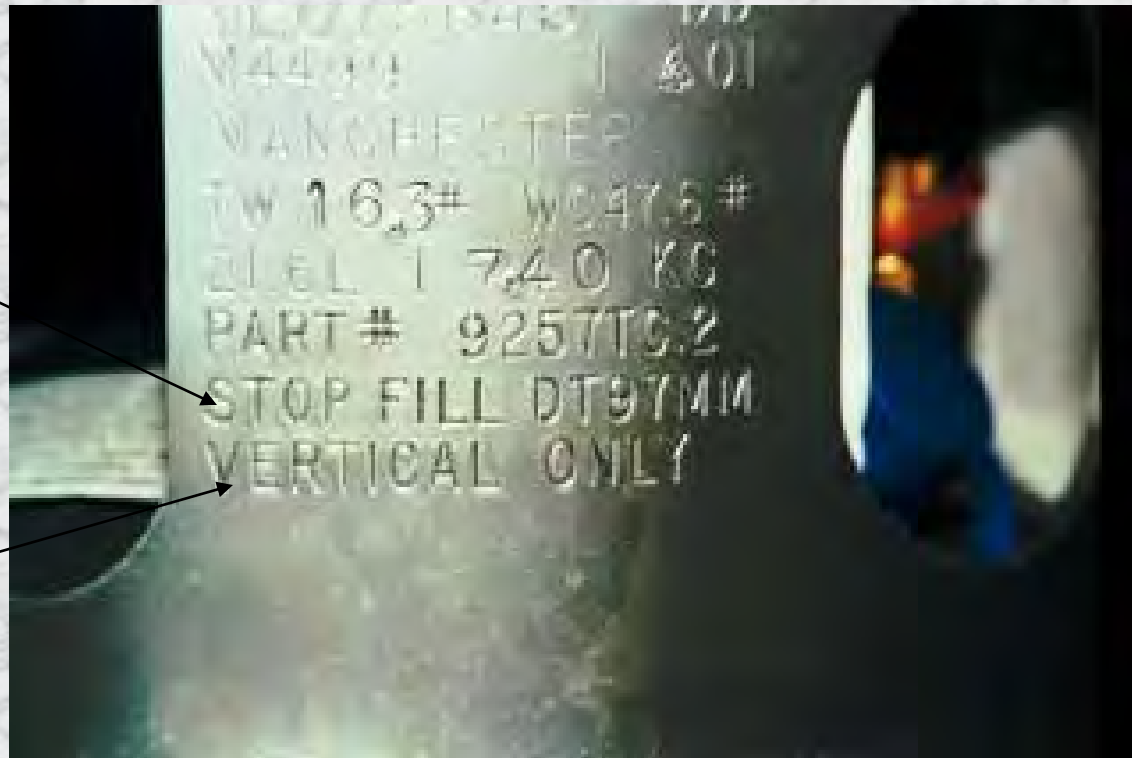
## Types of propane fuel cylinders

- **Vertical**
- **Horizontal**
- **Vapor Draw**
- **Liquid Draw**
- **Standard 4E240**
- **4E240 W/OPD**



# Propane Fuel Cylinders

## DOT Propane Cylinder Markings



• Stop Fill (OPD)

• Vertical only





# **Filling Propane Cylinders**

**Have cylinders filled at a qualified service filling station**

**Cylinders may be filled using:**

- **Volume method.**
- **Weight method**
- **Using the OPD**





# Transporting and Storing Propane Cylinders

- Store Fuel cylinders in a lockable ventilated storage rack
- Store fuel cylinders in the vertical position
- Storage rack should be at least 5 feet from any opening in the building
- Empty used cylinders is to be stored outside in rack
- Never store fuel cylinders in an enclosed place like your van or trailer
- Cylinders being transported should be secured in some manner





# **Installing Cylinder On The Machine**

- **Check cylinder for overfill before taking it into the building**
- **Locate the machine in a well ventilated area**
- **Install cylinder on the machine with pressure relief valve pointing to the side**
- **Connect the fuel hose to the cylinder, hand tight**
- **Open the service valve and check for any possible leaks**
- **To remove cylinder from the machine reverse procedure**





# Operating The Propane Powered Floor Machine

- Check oil level in the engine
- Check dust filter on top of the engine
- Check air filter on the carburetor
- Check pad and pad holder
- Install fuel cylinder following the previous instructions
- Place throttle in choke position
- Turn ON the key and activate the starter
- When the engine starts move the throttle lever to the run position
- Allow the engine to warm up slightly before operating



# Preventive Maintenance (PM)

The Operator is responsible for PM, Preventive Maintenance. This includes items mentioned earlier.

- Oil level
- Dust Filters
- Air cleaners
- Pad holder condition
- Pad selection
- Cleaning the machine after use
- Storage and transportation of fuel cylinders
- Checking for overfill
- Have the machine serviced regularly

**Dust Filter**



**Air Filter**





# Safety Issues You Are Responsible For

- Check for overfill
- Service machine regularly (PM)
- Secure fuel cylinders while transporting them
- Store cylinders properly
- Check air & dust filters each time you use the machine
- Be alert for the odor of propane
- Make sure work area is properly ventilated
- Do not use any cylinders except DOT 4E240
- Be aware of standards and codes that relate to your work



# **This Ends The Safety Awareness Slide Program**

**Your instructor may give you a written examination covering many things we have discussed during this program. If so you will find it to be a fine review.**

**It is a multiple choice test with only one correct answer to each question.**

**If you have taken any notes during this part of the program and have questions on any points covered or not covered please ask them of your instructor now.**





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**Thanks You For  
Participating In The  
Safety Awareness  
Workshop**



**We wish you success  
As A Professional  
Propane Powered  
Floor Maintenance**

