

# 2015 Onsite Wastewater Mega-Conference

## Chemical Conditioning with Polymer

Presented by

Tom Frank, Tim Frank Septic Tank Cleaning Co  
Tom Ferrero, Elkhart Environmental Processing

November 3, 2015

# Chemical Conditioning with Polymer



The End

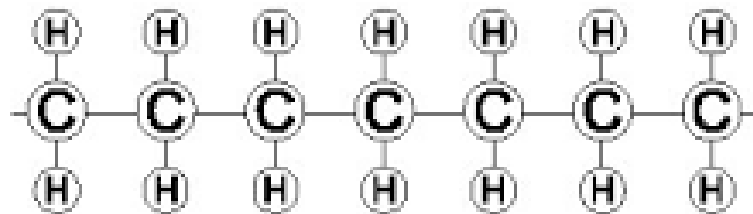


# OVERVIEW

- What is a Polymer
- Common Physical Forms
- Handling
- Factors Affecting Performance

# What Is A Polymer?

**A Polymer is a chain of organic molecules made up of many repeating units.**

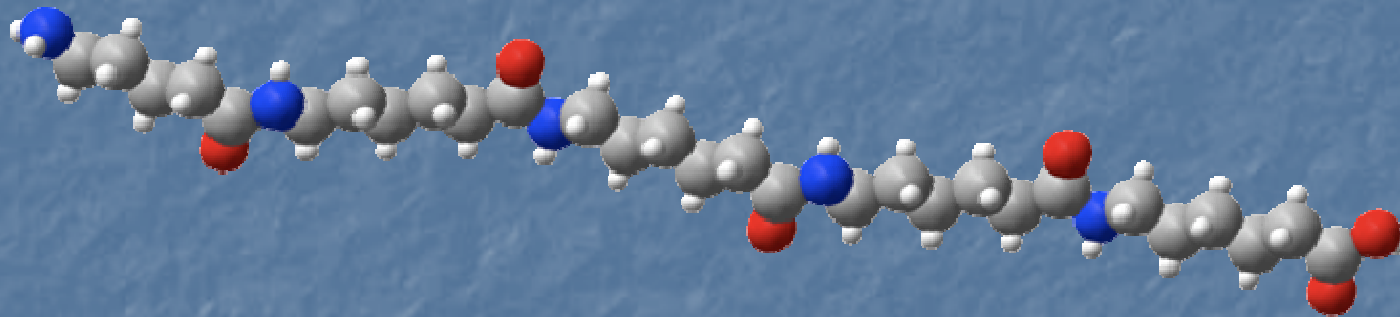


**$\text{CH}_2 - \text{CH}_2 = \text{Repeating Unit (monomer)}$**

Portion of a polyethylene molecule made of repeating units of carbon and hydrogen.

# What Is A Polymer?

**A Polymer is a chain of organic molecules made up of many repeating units.**

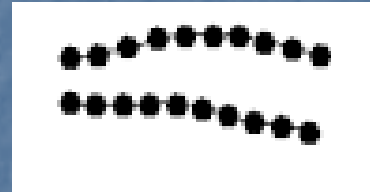


# Polymer Characteristics

- **Molecular Structure**
- **Molecular Weight**
- **Charge**
- **Physical Form**

# Molecular Structure

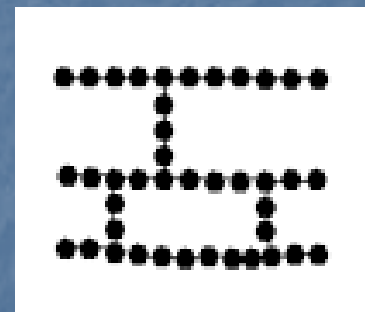
- **Linear**



- **Branched**



- **Cross- linked**





# Molecular Weight

- **Low** < 100,000
- **Medium** 100,000 - 500,000
- **High** 500,000 – 6,000,000
- **Very High** 6,000,000 – 18,000,000

# Charge

- Anionic (-)
- Nonionic (neutral)
- Cationic (+)

# Physical Form

- Emulsions 25-50%
- Dry 88-95%

# Emulsion Polymer

- Water Soluble Polymer in Oil
- Shelf Life – 6 months
- Keep from Freezing
- Need to form solution in batch tank – mix for 20 minutes min
- Cleanup with high pressure water or 'oil dry'
- VERY Slippery

# Emulsion Polymer



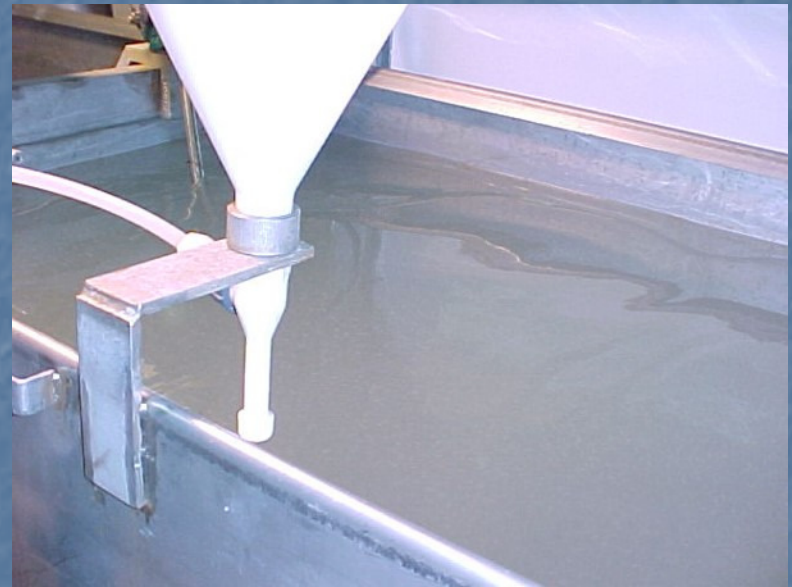
# Emulsion Polymer



# Dry Polymer

- Longest Shelf Life
- Highest Active Polymer Content
- Need to form solution in batch tank – mix for 1 hour minimum
- Bags must remain sealed
- Cleanup with broom or vacuum
- NEVER add water to the spill

# Dry Polymer





# Dry Polymer



# Factors Affecting Performance

- Polymer Charge and Molecular Wt
- Polymer Dose
- Polymer Concentration
- Polymer make-down
- Addition Point
- Solids Concentration of Septage
- Other chemicals present

# Factors Affecting Performance



# Factors Affecting Performance



# Chemical Conditioning with Polymer

