Olin™

PolyProcessing
SOLUTIONS, SIMPLIFIED.

Since 1971

Product Safety and Handling Seminar

Poly Processing Company:

- Optimizing Polyethylene
- Specializing in XLPE
- Building Systems for Chemical Storage

Chemical Storage Systems

- **Capacities to 15,500 Gallons**
- **Temperatures to 150° F**
- **Pressures/Vacuum-Atmospheric**

Today's Goals

- Safety
- Product Integrity
- Tank Longevity

Issues Identified by Olin

- Budget
- Cleaning
- Product degradation
- Correct materials for application
- UV Protection
- FRP failure

- **Crosslinked HD Polyethylene**
- **FRP – Fiberglass**
- **OR-1000 Resin System**
- **Full Drain Tanks - IMFO**
- **Double Walled Tanks**
- **Venting / Flex Couplings**

- **Crosslinked HD Polyethylene**
- **FRP – Fiberglass**
- **OR-1000 Resin System**
- **Full Drain Tanks**
- **Double Walled Tanks**
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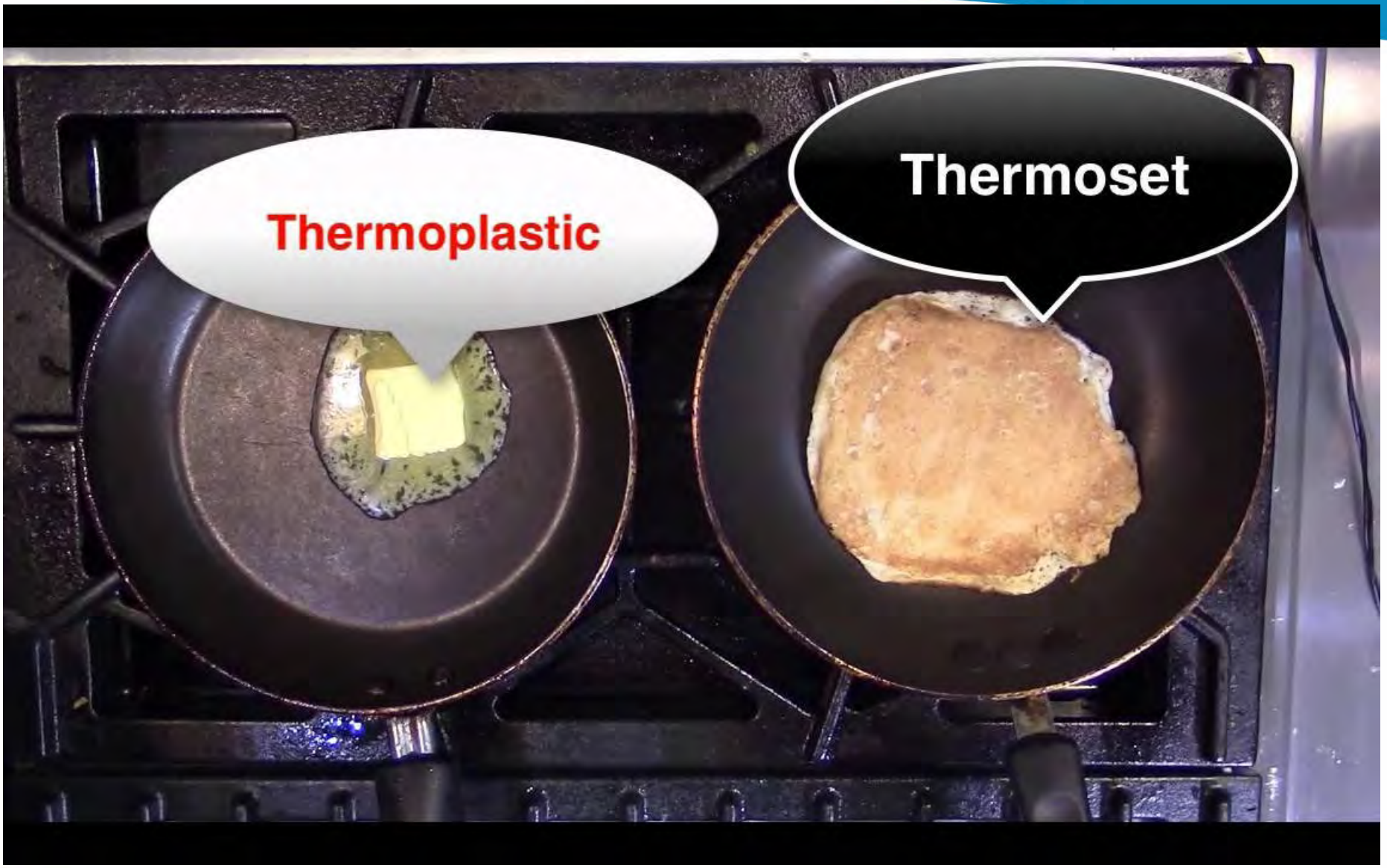
Thermosets

And

Thermoplastics

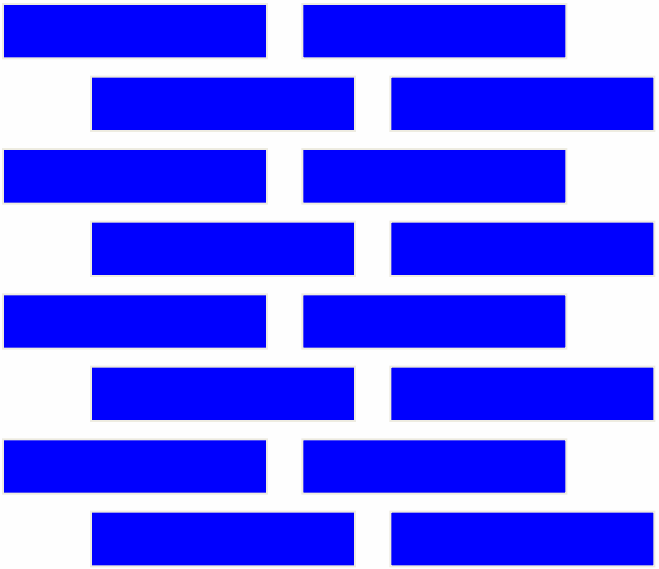
Polyethylene Resin


Thermoplastic
Thermoset

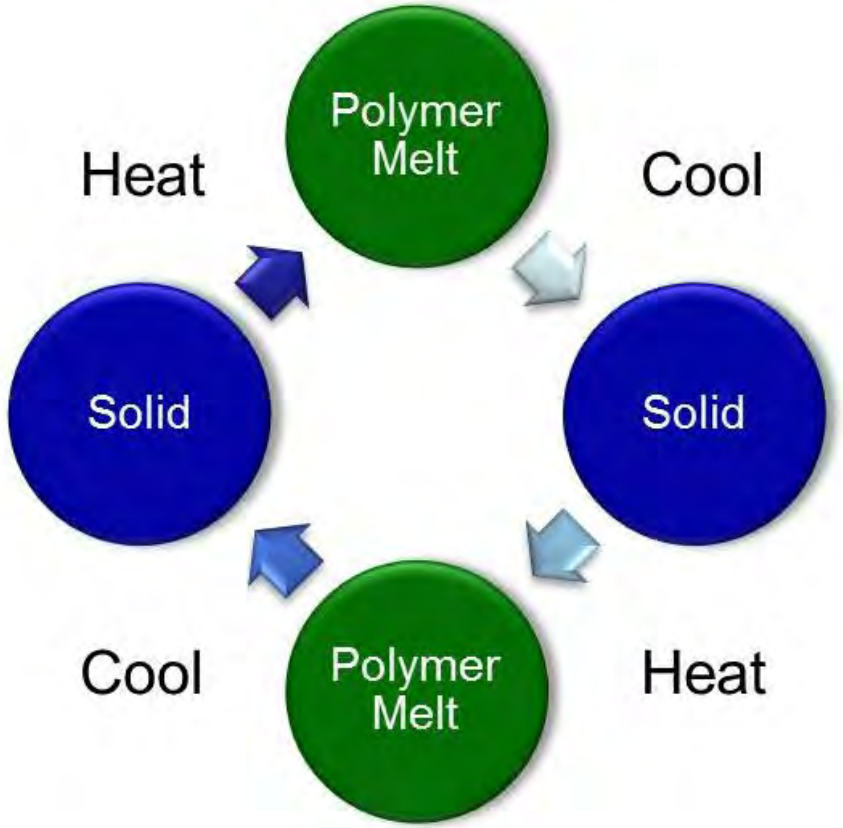
Structure

HDPE

Entanglement



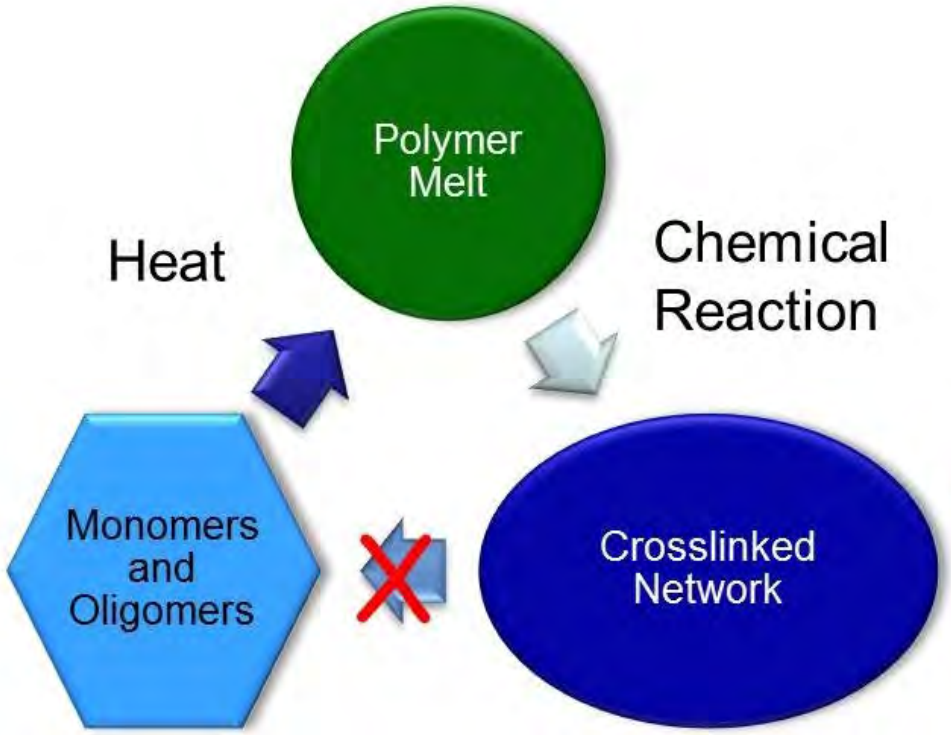
Thermoplastic

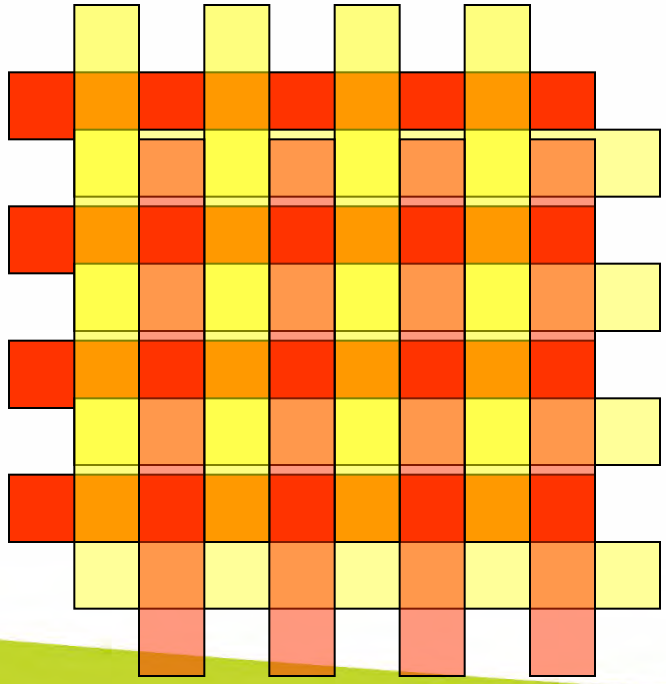


Unsurpassed Structure

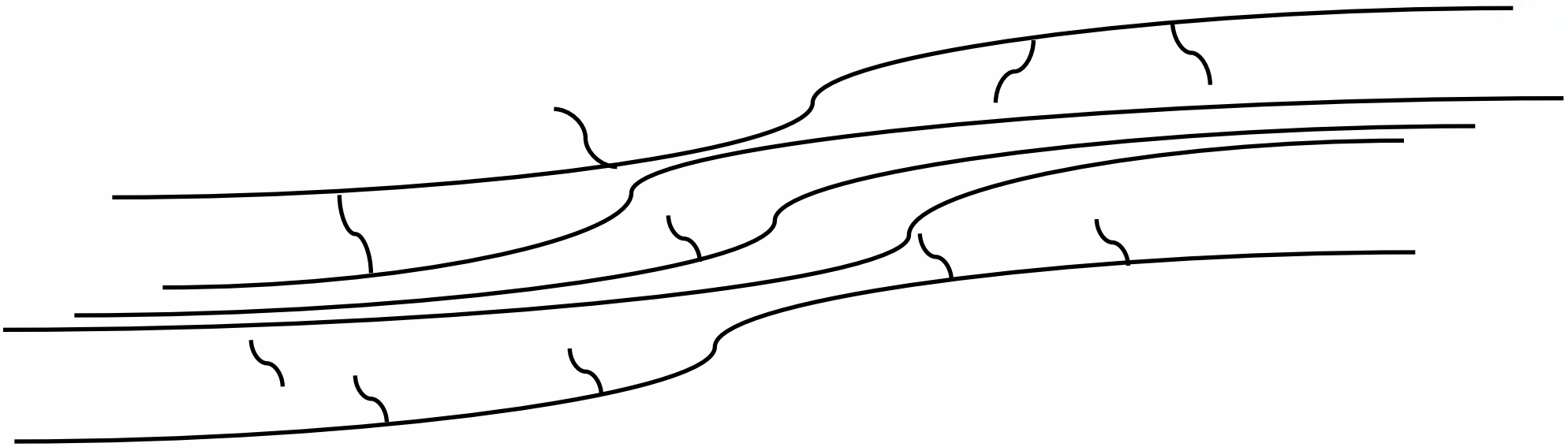
HDXLPE

Chemical Bonding

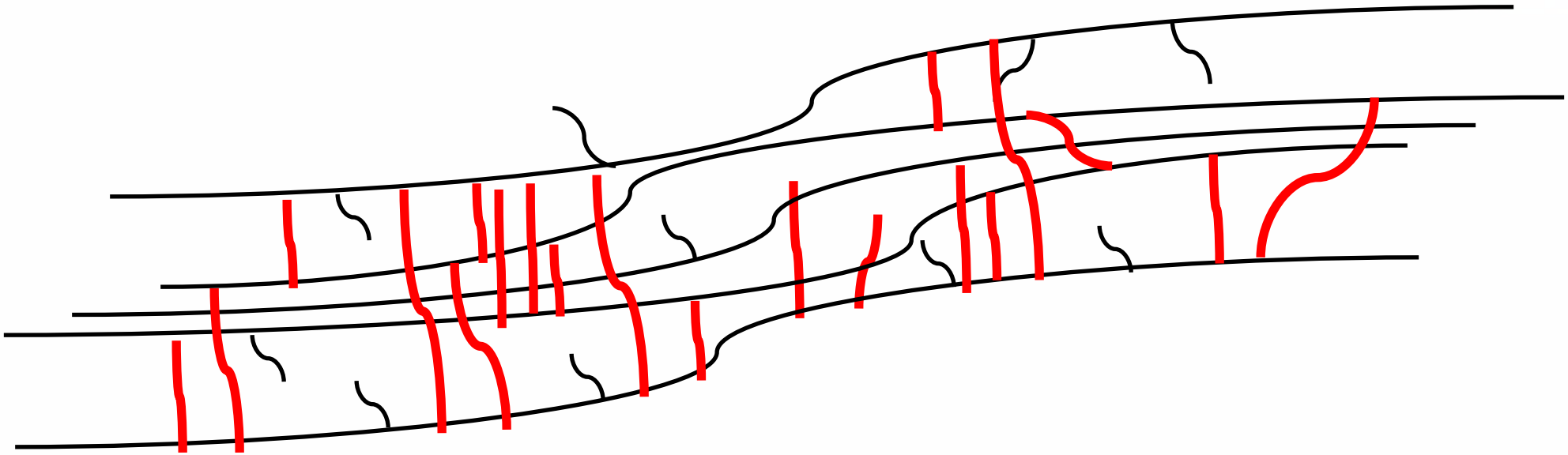




Thermoset

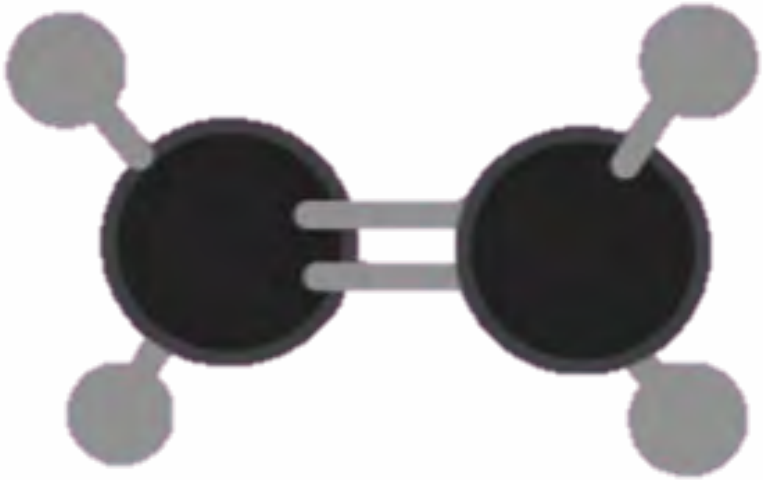


HDPE (Linear Polyethylene)

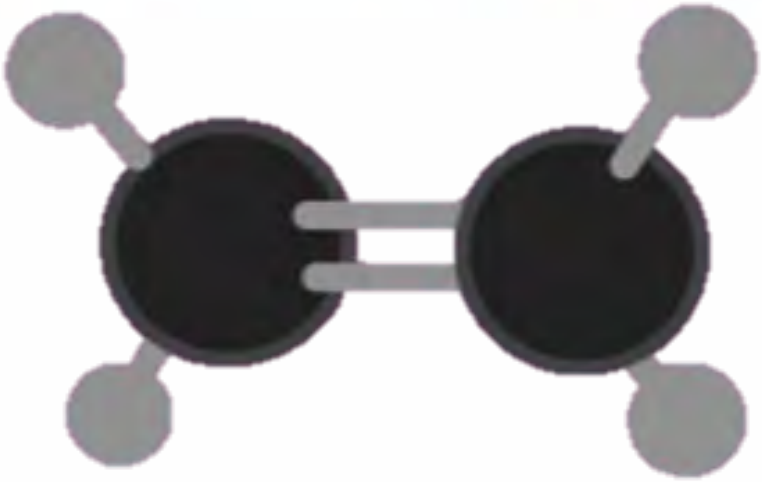


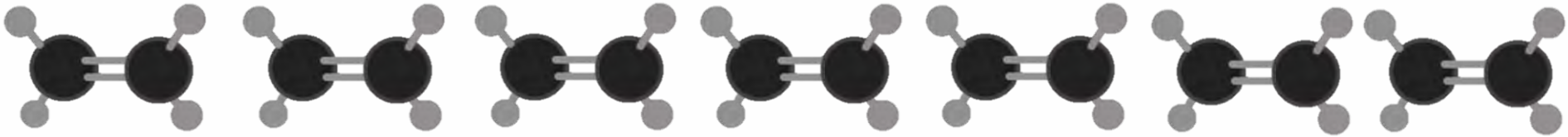
HDXLPE

Monomers
To
Crosslinked Polymers

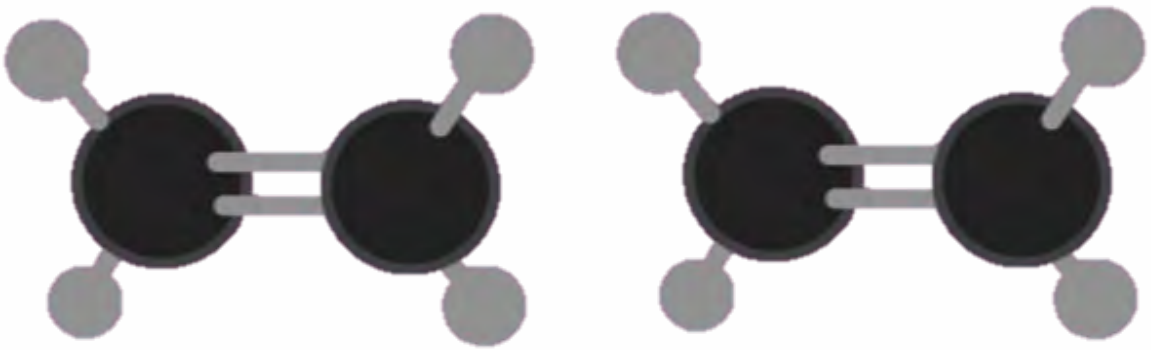


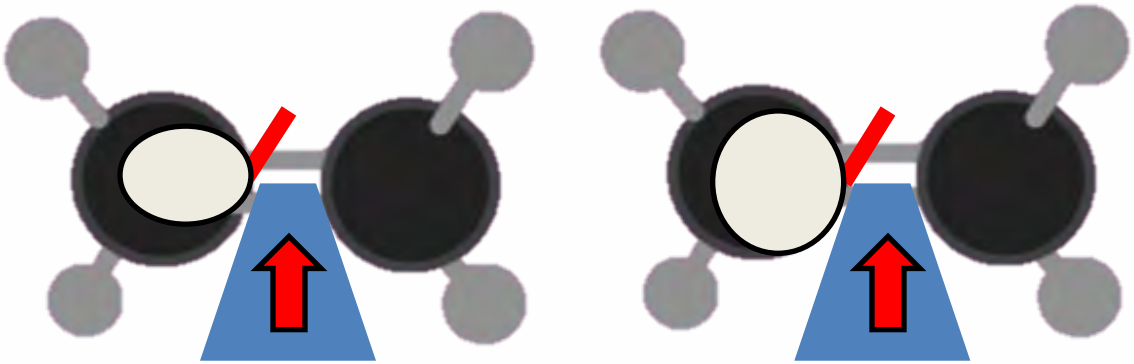
Ethylene

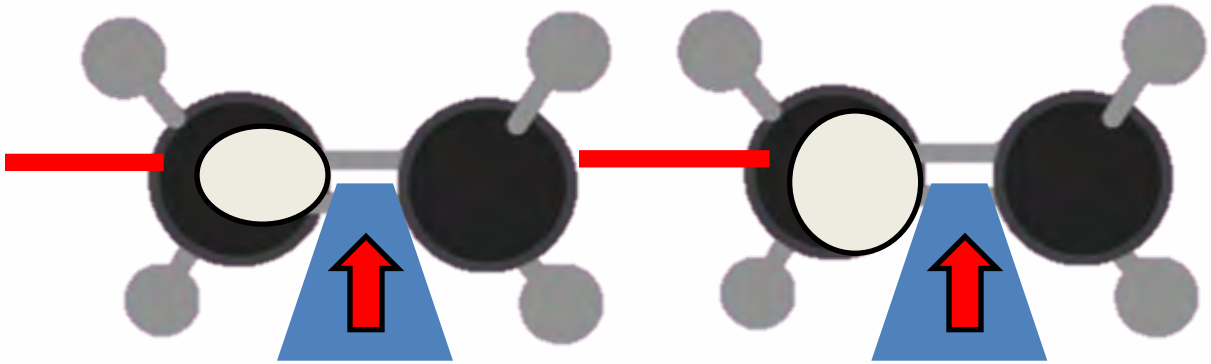


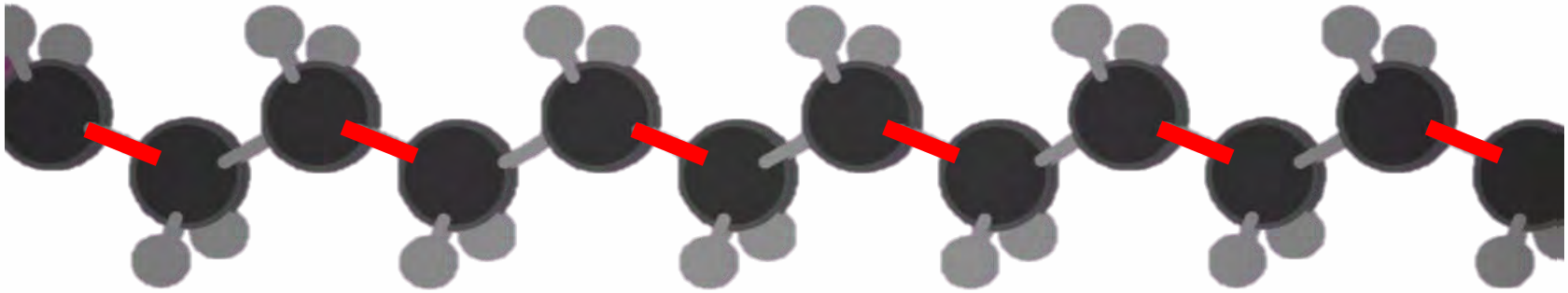


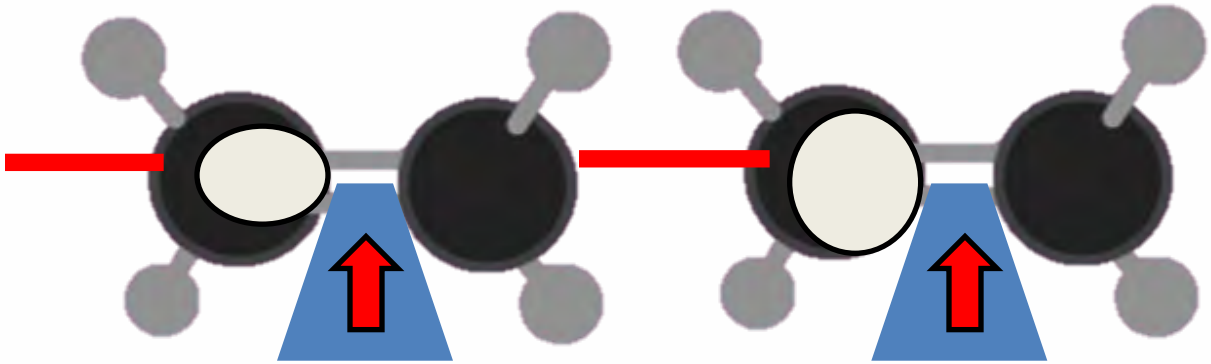
Polyethylene

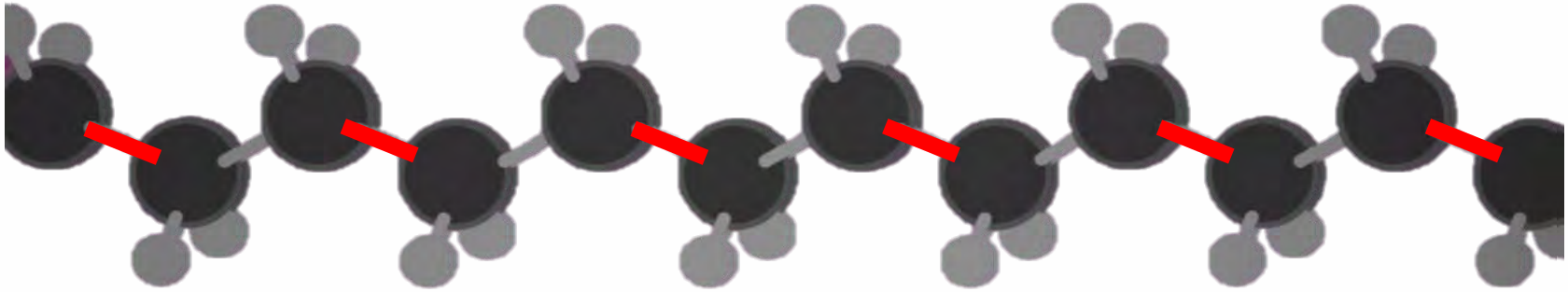


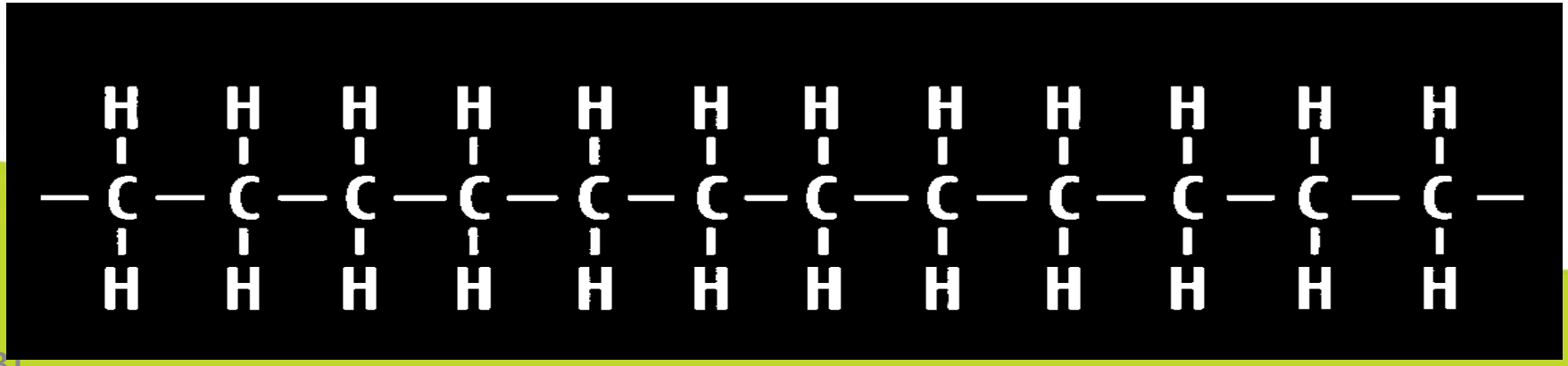








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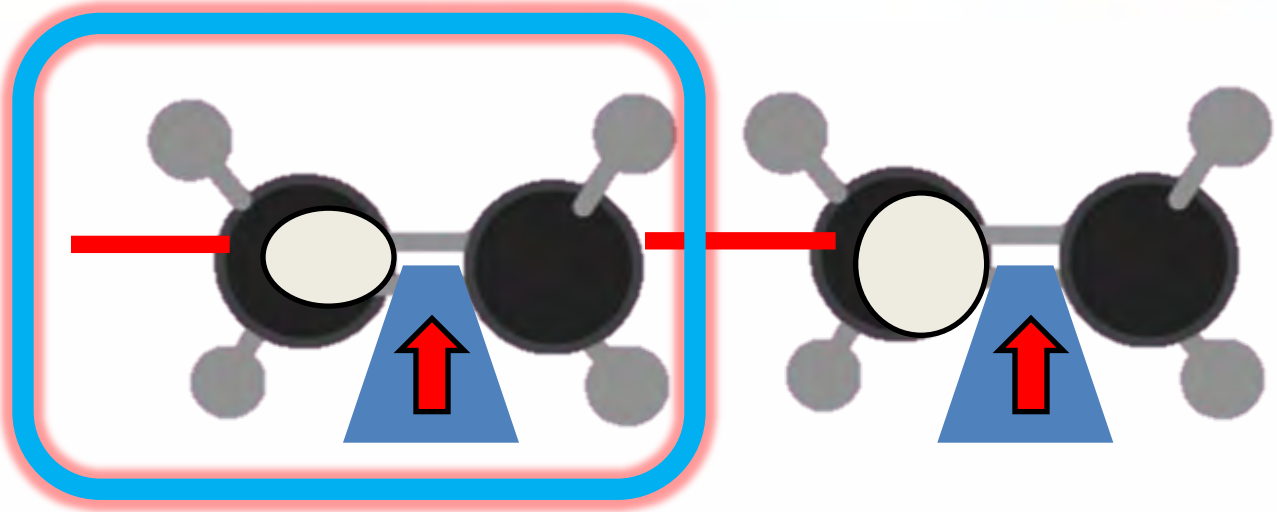
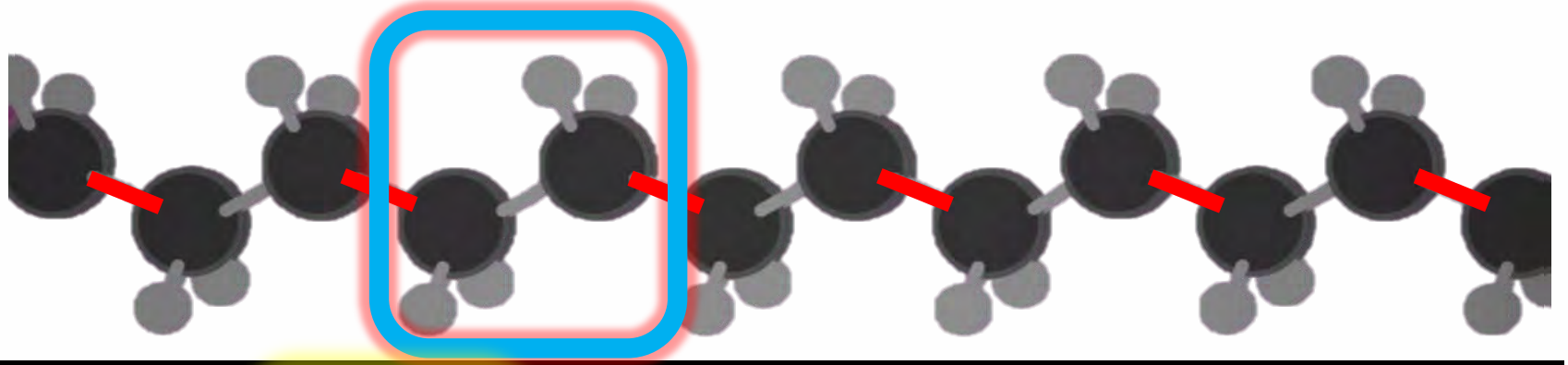
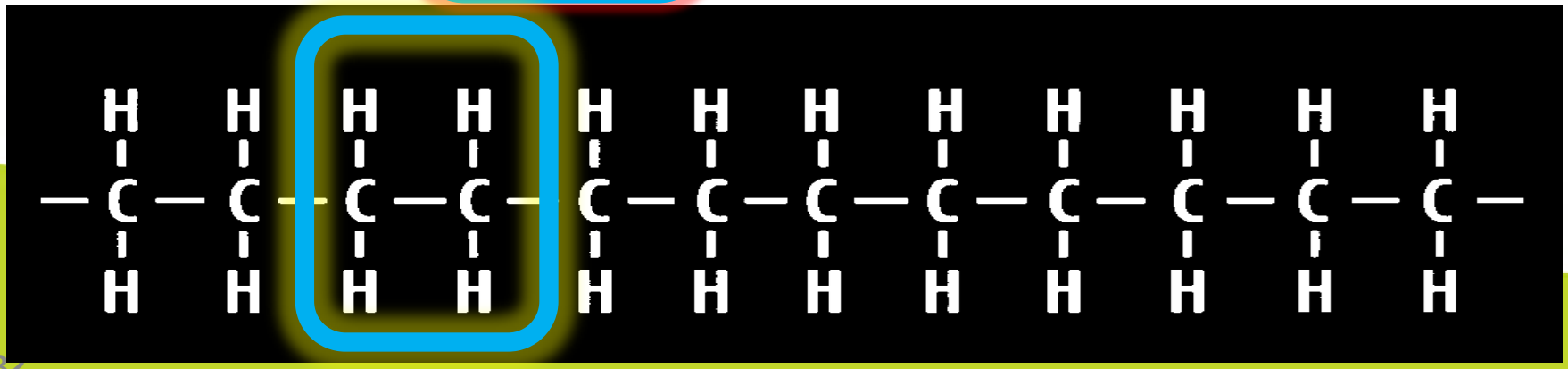
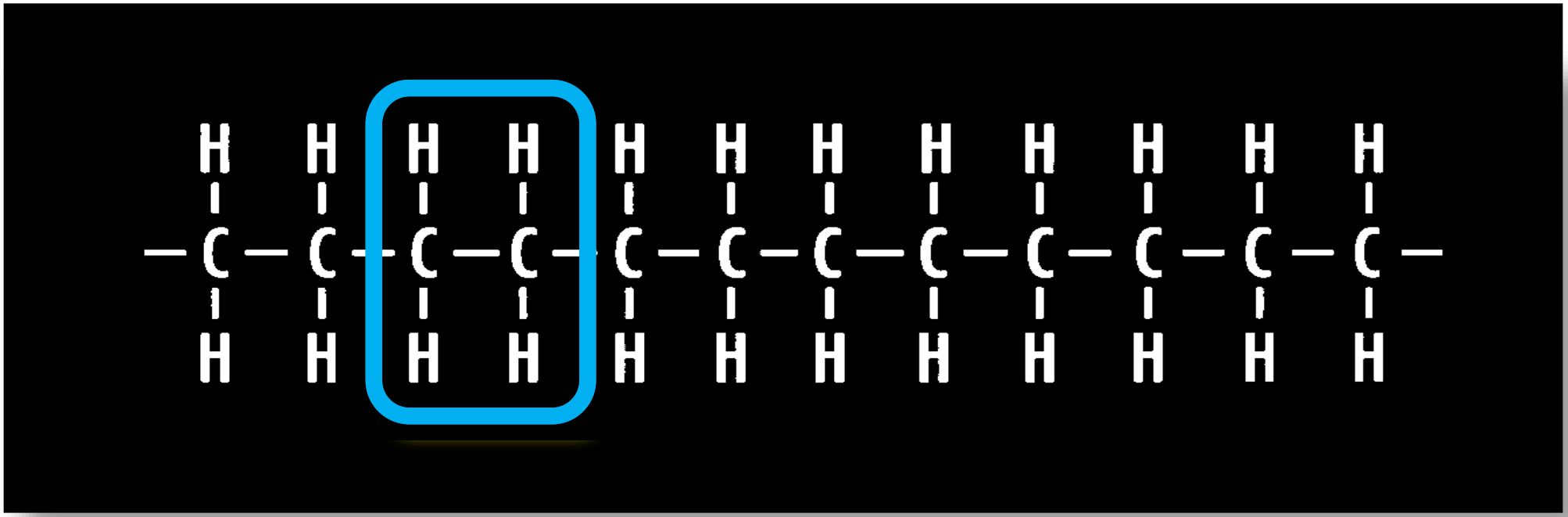
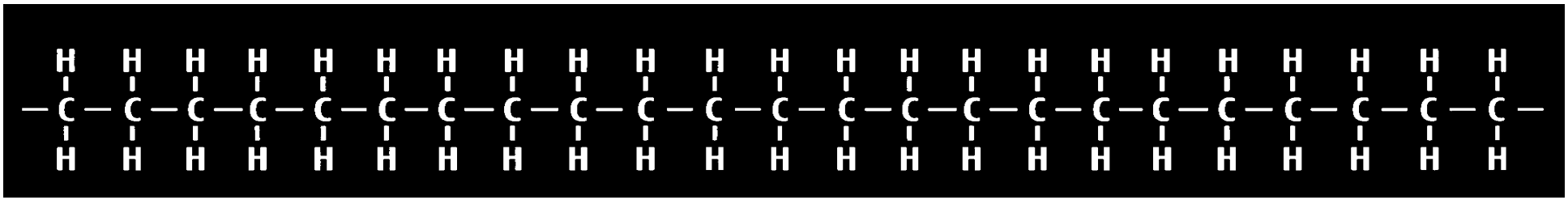


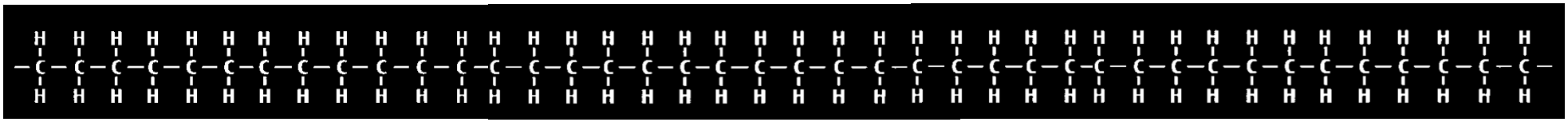


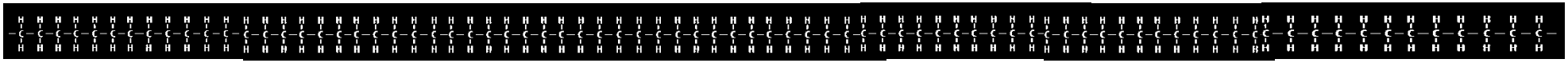


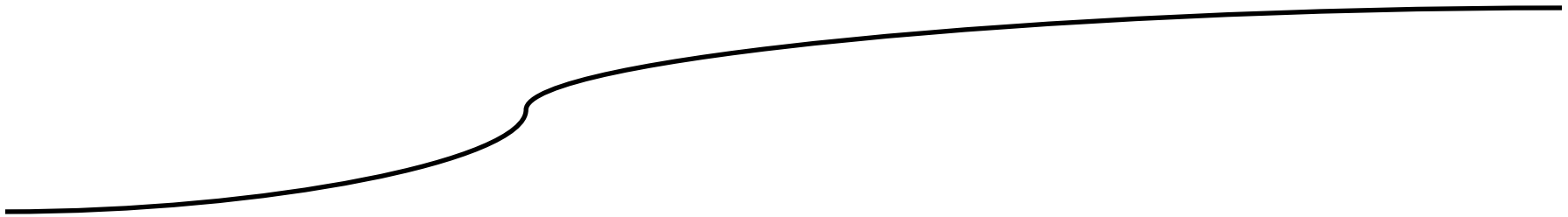


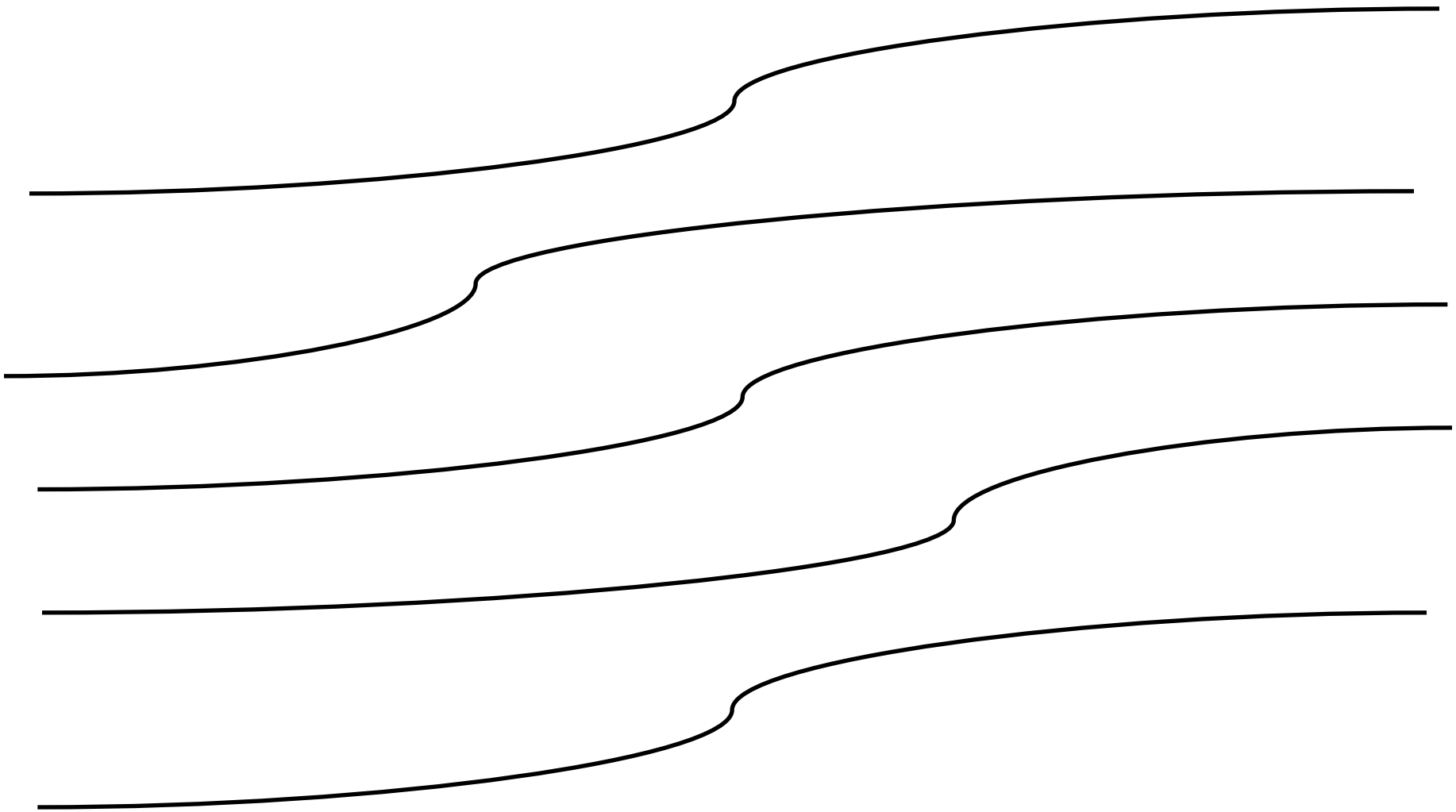
POLYETHYLENE

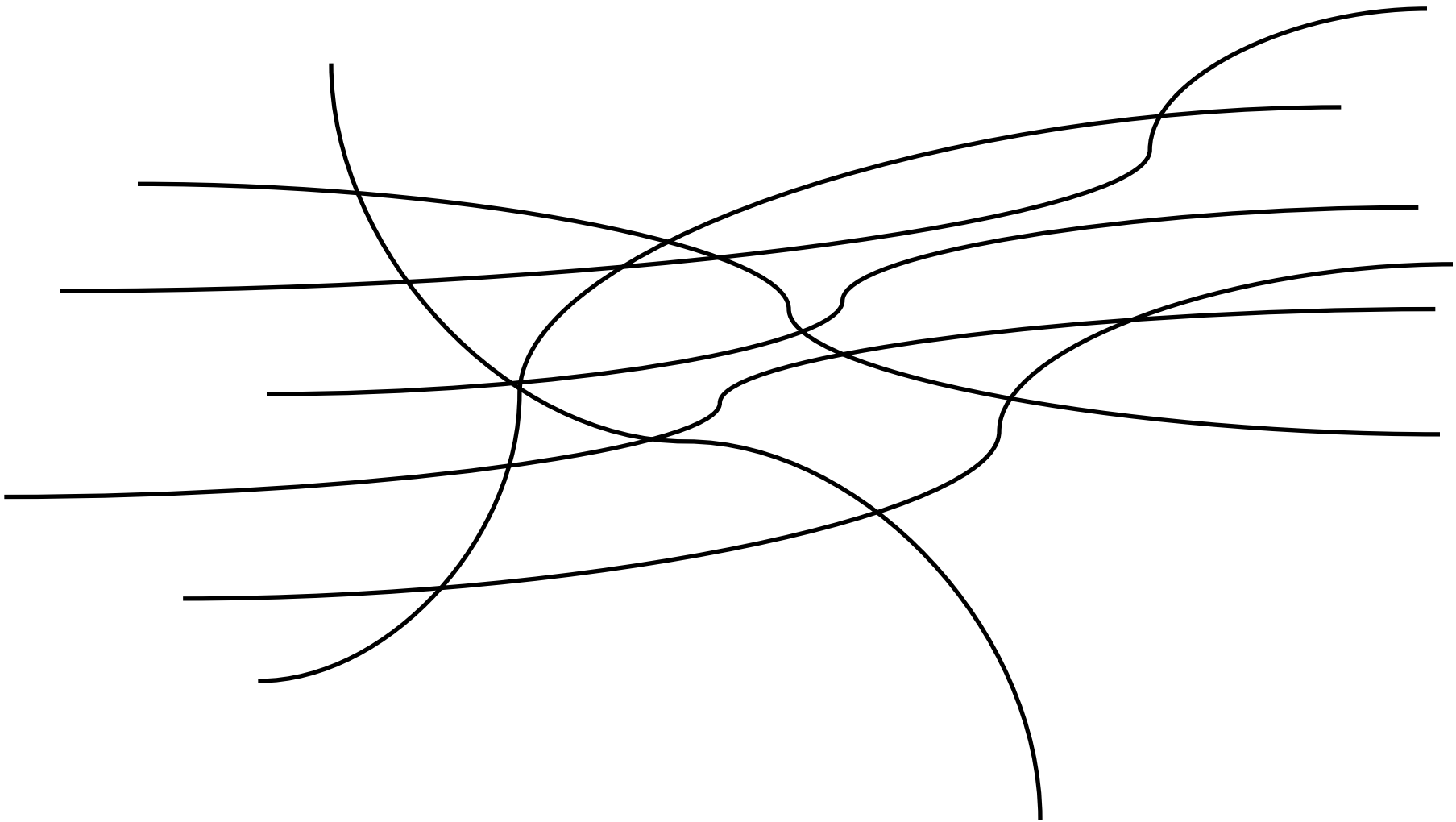








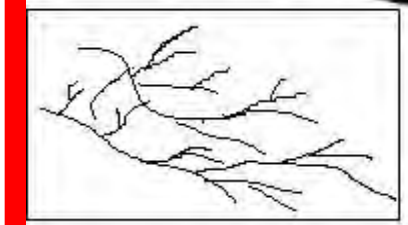


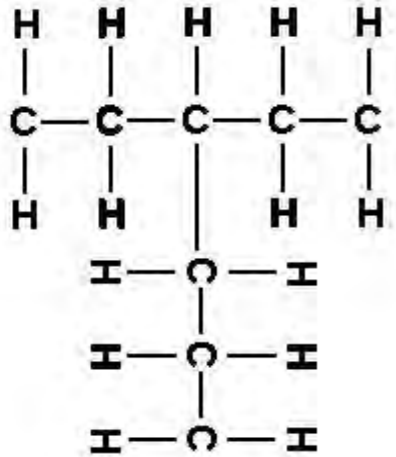


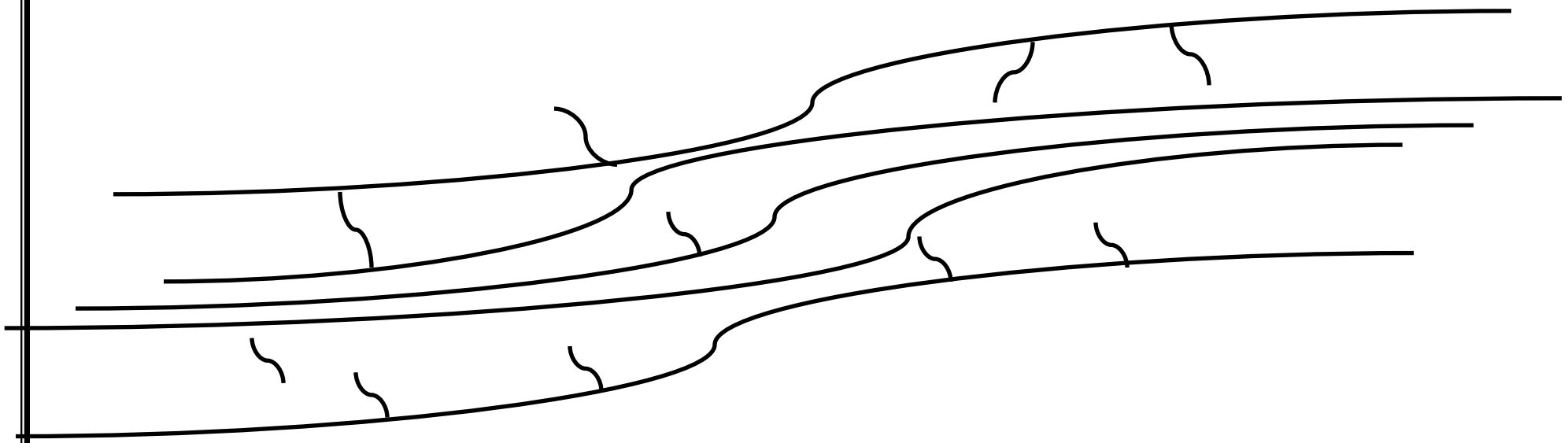
Linear Polymers

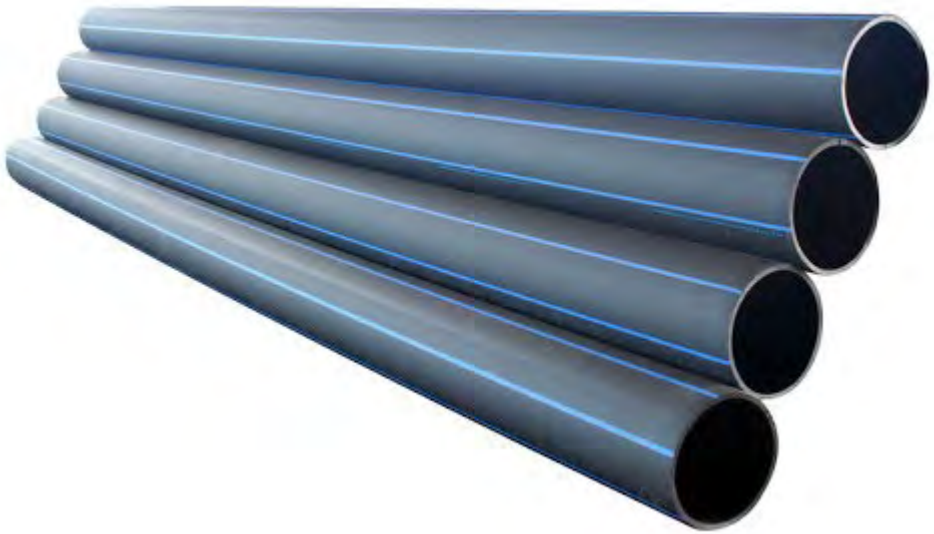
- HDPE
- LDPE
- LLDPE

LDPE







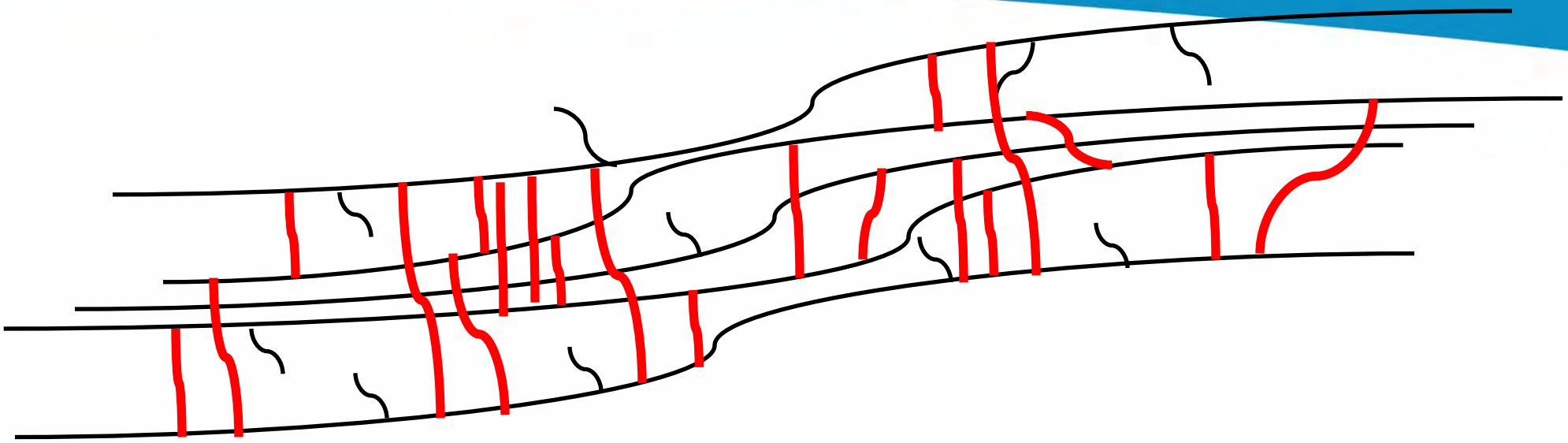


HDPE

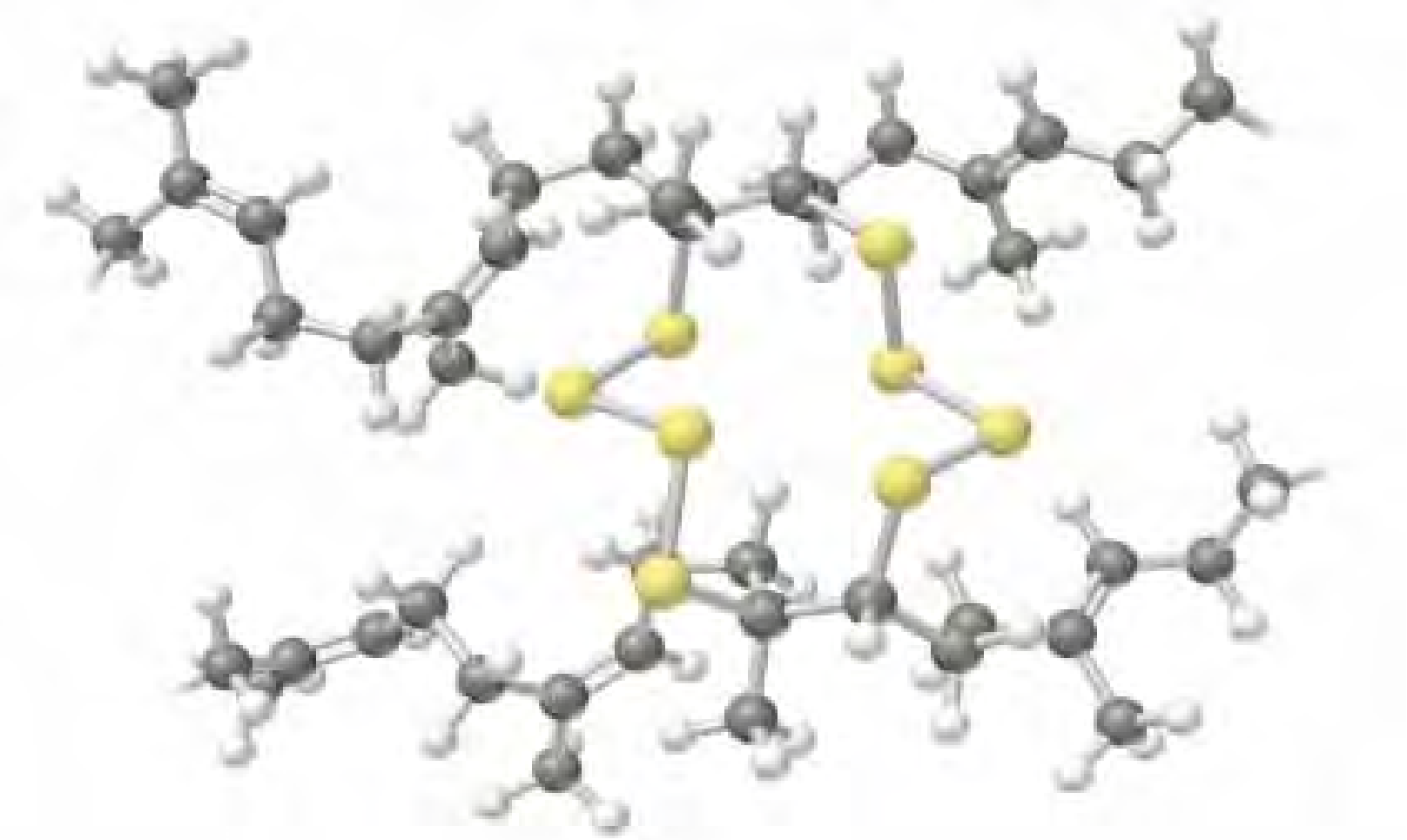
LDPE

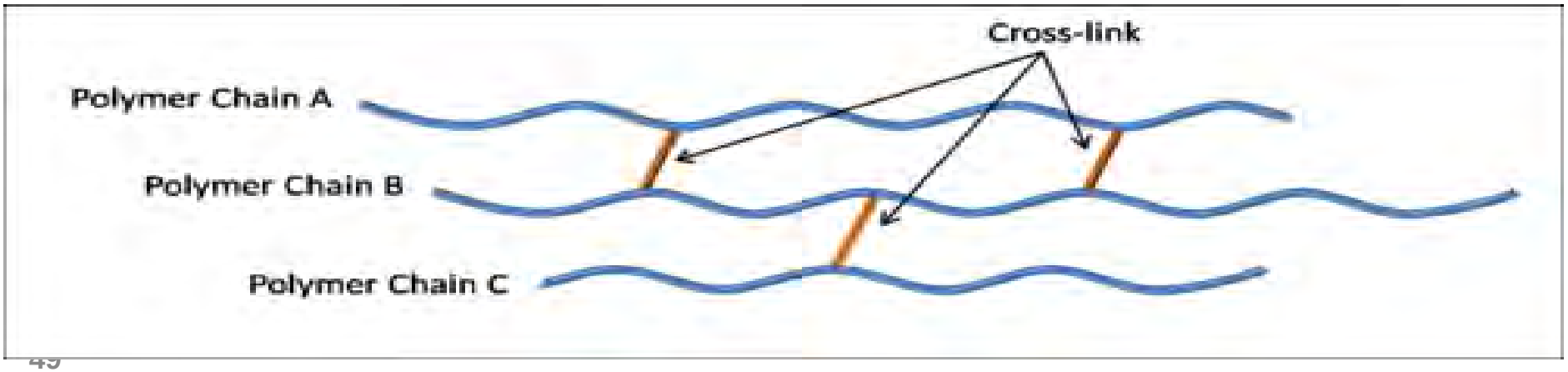
Crosslinked Polymers

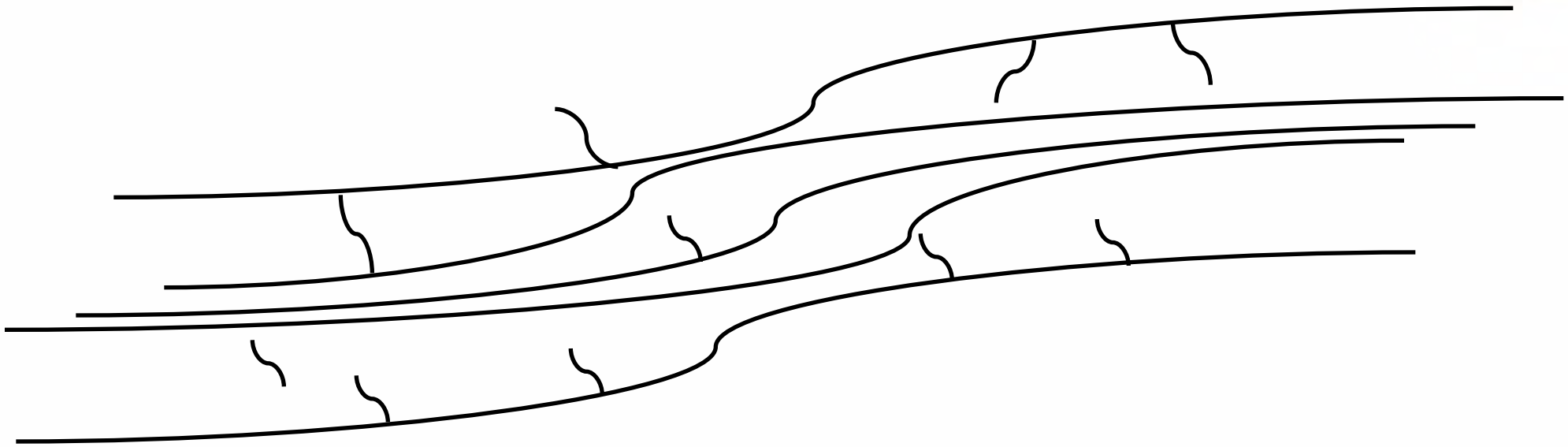
HDXE



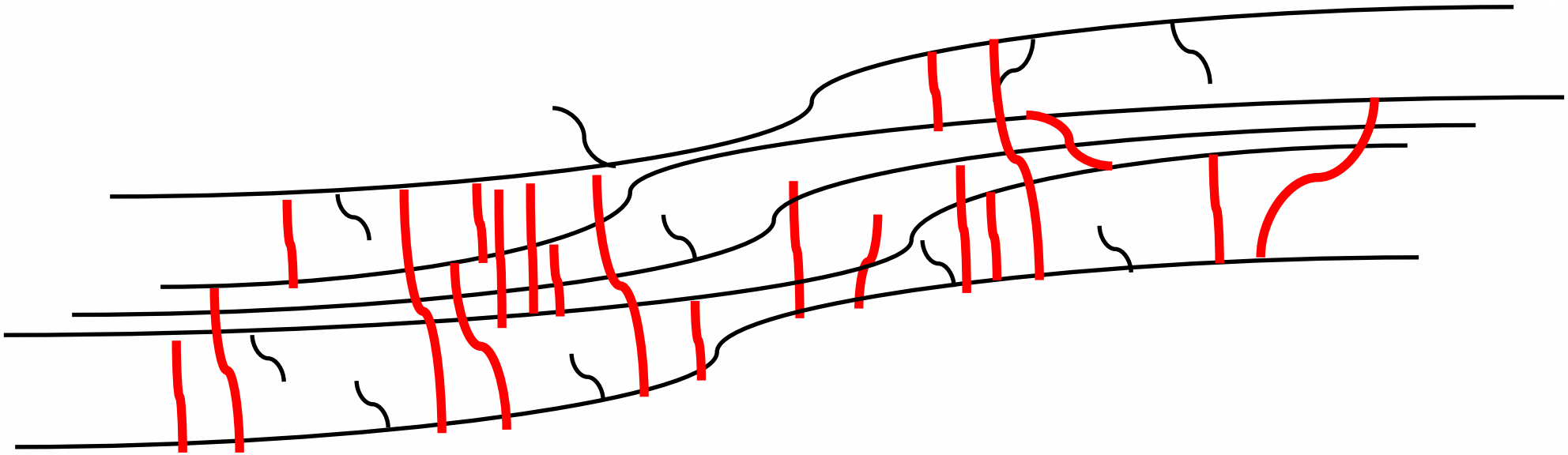
HDXLPE




Cross-link
Polymer Chain A
Polymer Chain B
Polymer Chain C

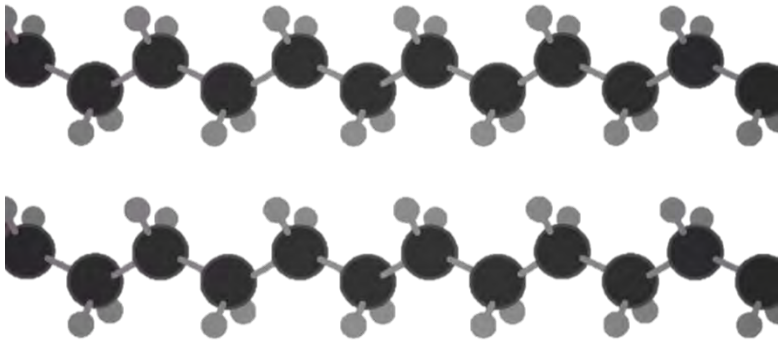


HDPE (Linear Polyethylene)

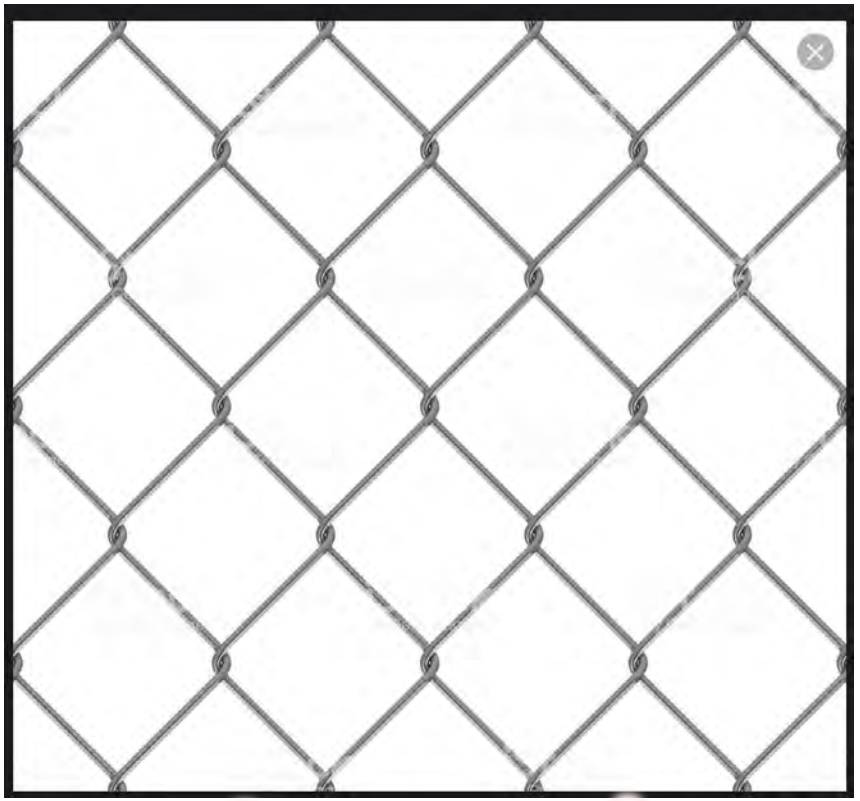


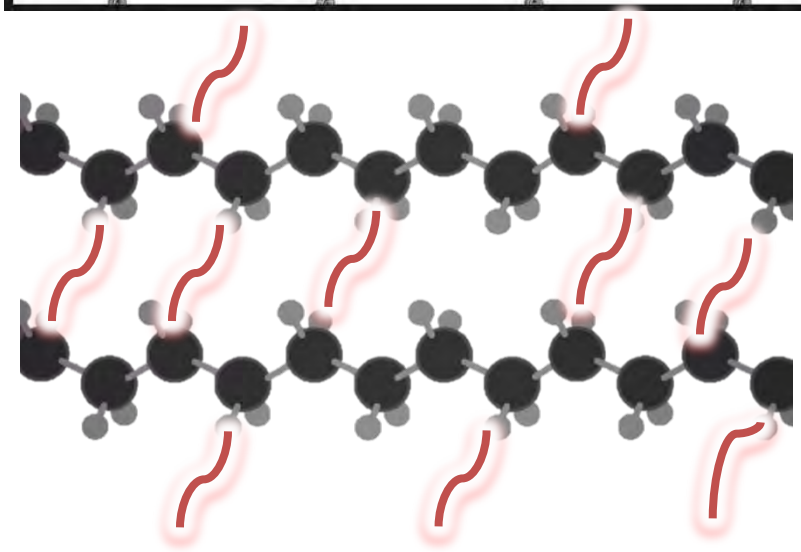
HDXLPE

HDPE



XLPE





Safety Simplified

HDPE Tank

HDXLPE Tank

Gel Test for XLPE

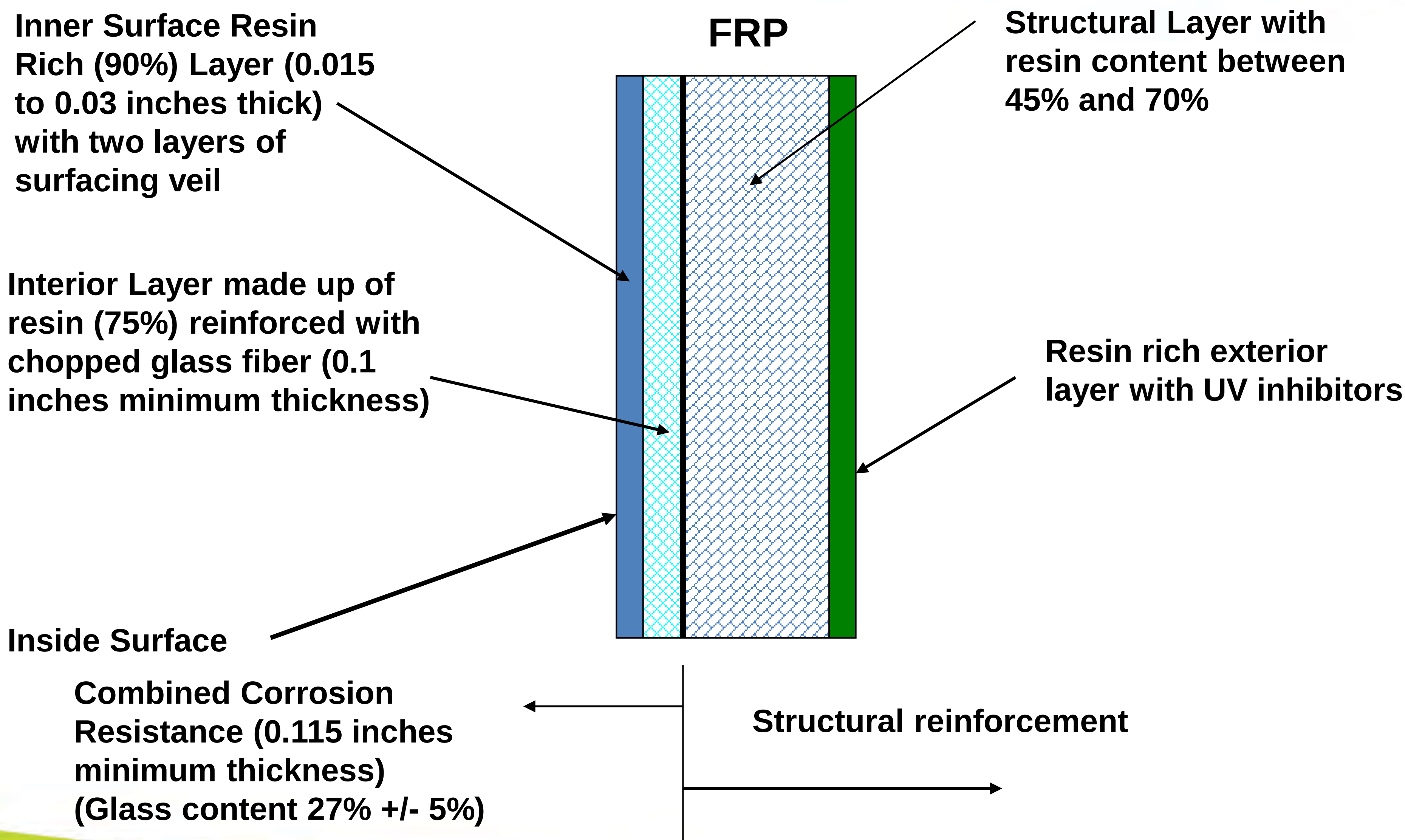
ASTM D 1998 additional test

- Solution of Cyanox2246 and xylene
- Weight before and after gives gel %
- Must be 60% or greater at the inner most 1/8” of the tank wall.

- Crosslinked HD Polyethylene
- **FRP – Fiberglass**
- OR-1000 Resin System
- Full Drain Tanks
- Double Walled Tanks
- Venting / Flex Couplings

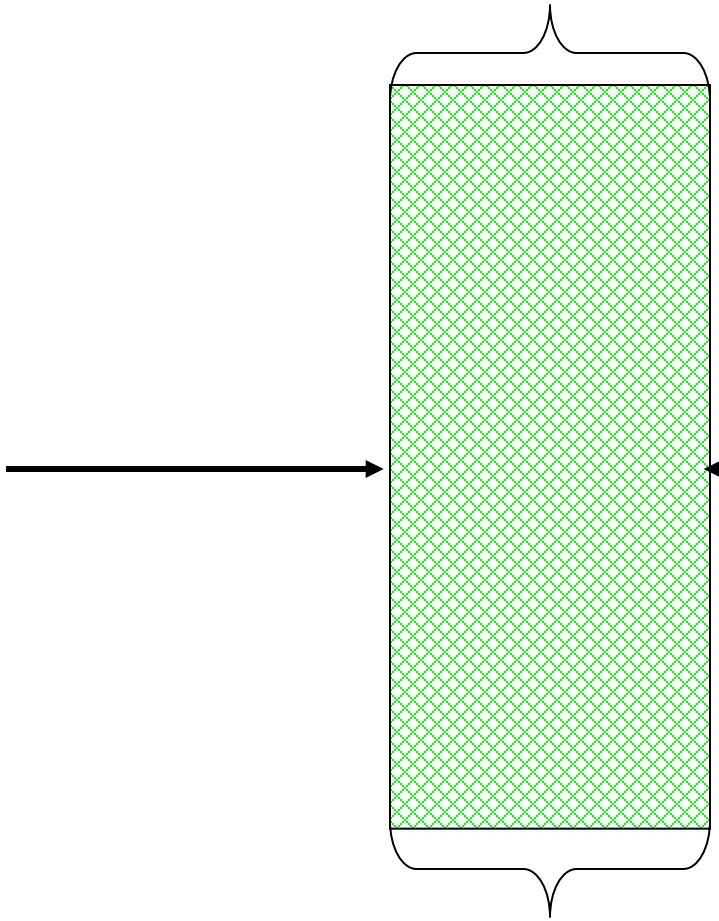
FRP Tank Process

Seamless & Stress Free


FRP
Inner Surface Resin Rich (90%) Layer (0.015 to 0.03 inches thick) with two layers of surfacing veil
Structural Layer with resin content between 45% and 70%
Interior Layer made up of resin (75%) reinforced with chopped glass fiber (0.1 inches minimum thickness)
Resin rich exterior layer with UV inhibitors
Inside Surface
Combined Corrosion Resistance (0.115 inches minimum thickness) (Glass content 27% +/- 5%)
Structural reinforcement

XLPE

Structural Layer



Inside Surface

Exterior Surface

Corrosion Resistance
(0.1875 to 1.50 inches
based on tank size & SPG)

Construction

- Seamed
  - FRP
  - Steel
- Seamless
  - Polyethylene

Quality Assurance

- **Real-time monitoring for optimal finished product**
- **Records & stores data for each tank**
- **Ensures consistency**

Consistent and Reliable

ASTM D 1998

Wall Thickness

Hydro Test

Impact Test

- Crosslinked HD Polyethylene
- FRP – Fiberglass
- **OR-1000 Resin System**
- Full Drain Tanks
- Double Walled Tanks
- Venting / Flex Couplings

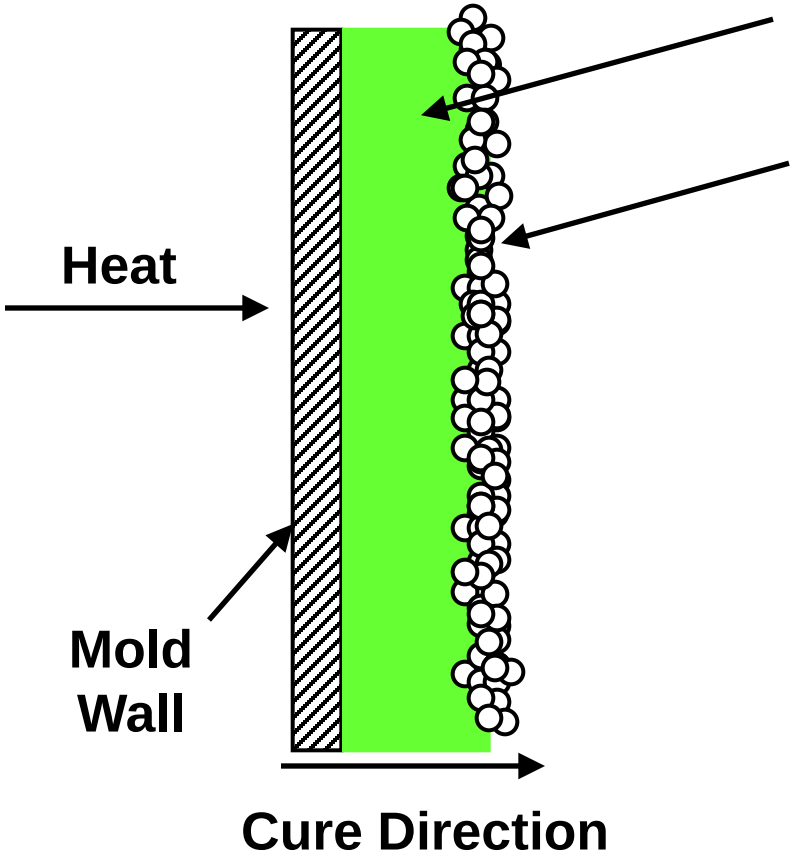
OR-1000™ Systems

- **Strong Oxidizer Applications**
  - **Sulfuric Acid**
  - **Sodium Hypochlorite**
- **Bonds to Crosslink**
- **4 Times Standard Anti-Oxidants**
- **NSF/ANSI 61 CERTIFIED for 35 Chemicals**
- **FDA Compliant**

CERTIFIED TO NSF/ANSI 61

OR-1000™ /XLPE Bonding

Achieving a homogenous transition between the two layers

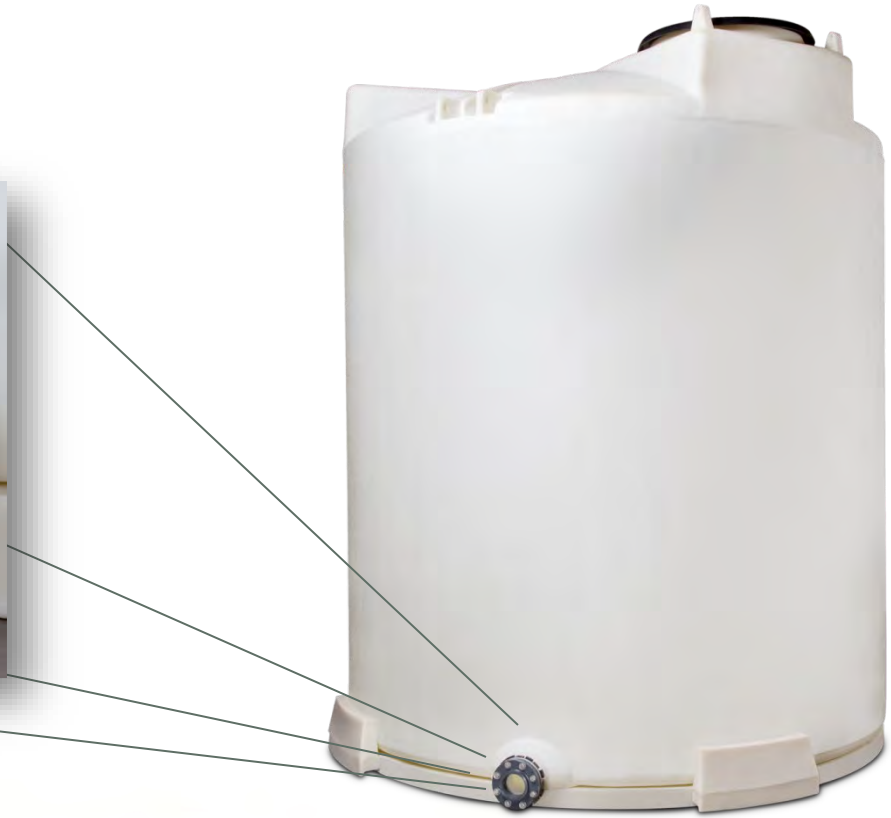


1. At cure, 95% of the XLPE has Crosslinked & transformed from powder to a semi- solid.
2. OR-1000™ is introduced, the remaining XLPE powder mixes with the OR-1000™ resin.
3. Tackiness of semi-solid XLPE material provides a coating effect on deposited OR-1000™ inner surface.
4. XLPE and the OR-1000™ system are essentially PE material and posses conditions for Crosslinking to occur.
5. The randomness of the X-linking creates covalent bonds between XLPE & OR-1000™ insuring proper bonding & compatibility.
6. With time/heat, all powder is cured creating a continuous & compatible solid cross-section.

- Crosslinked HD Polyethylene
- FRP – Fiberglass
- OR-1000 Resin System
- **Full Drain Tanks**
- Double Walled Tanks
- Venting / Flex Couplings

IMFO Simple Design

- Full Drain
- Seamless
- One-Piece



IMFO System

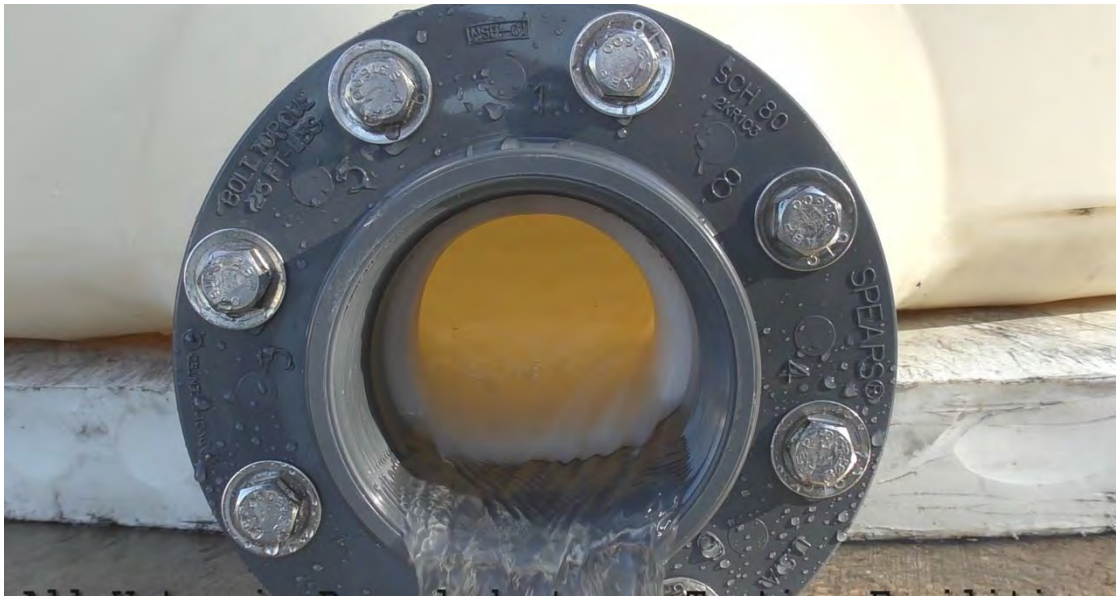
- **No Sidewall Penetrations**
- **Avoids Confined-Space Entry**
- **Prevent Sludge Build-Up**
- **Easy Clean**
- **External Fitting Access**

Tangible Safety

- Easy Clean-Clean From The Top
  - External Fitting Access
    - Avoid Confined-Space Entry

Sloped Bottom IMFO Tank

- **Industry leading molded-in full drain technology**
- **Sloped floor for maximum discharge**



IMFO

FRP Added Fitting

- Crosslinked HD Polyethylene
- FRP – Fiberglass
- OR-1000 Resin System
- Full Drain Tanks
- **Double Walled Tanks**
- Venting / Flex Couplings

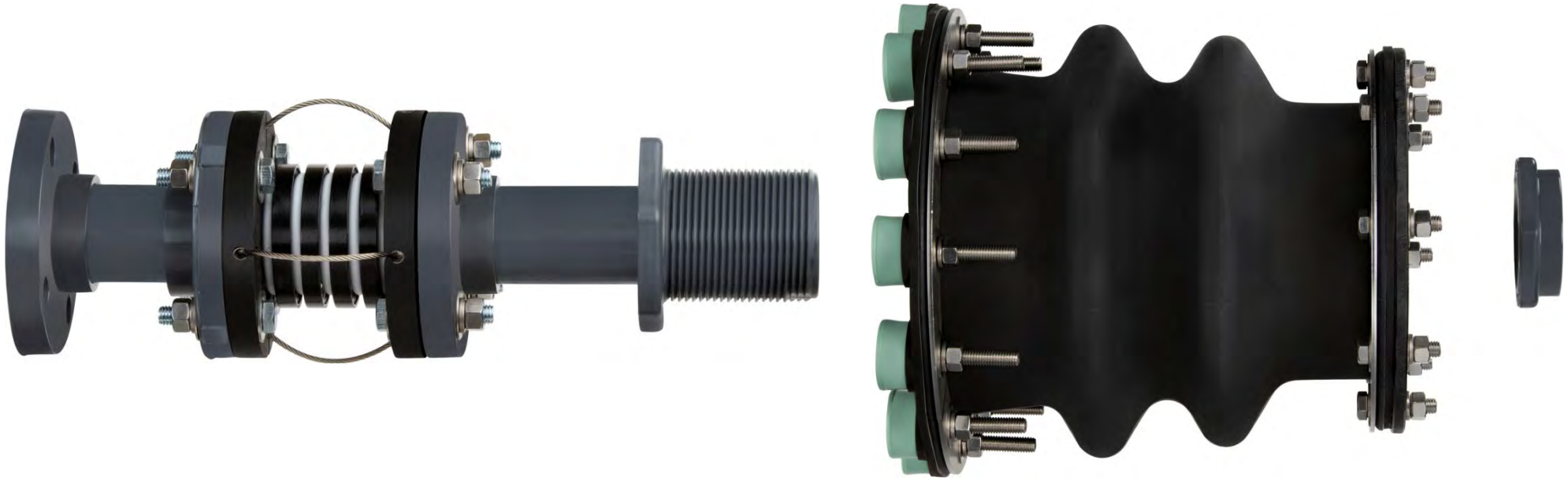
Environmental Care Simplified

SAFE-Tank®

Leveraged Investment

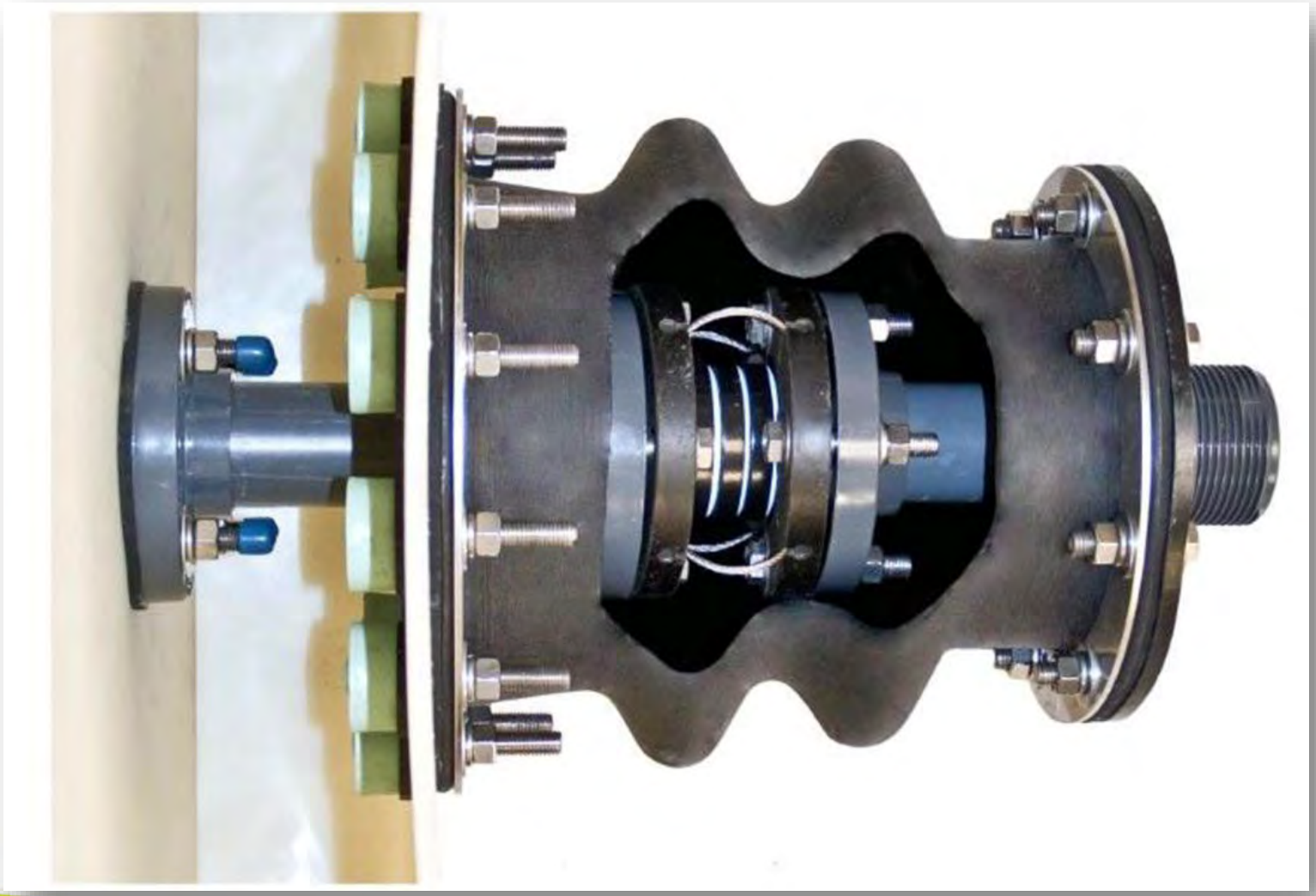
- **Employee/Equipment Protection**
- **Minimal Downtime**
- **Eliminates Expensive Concrete Containment**

Enhanced Bellows Transition Fitting



- **100% Chemical Containment**
- **Maintenance Friendly**

Enhanced Bellows Transition Fitting



Installed

Insure Dual-Wall Containment Fitting is “Contained”

Double Wall Piping

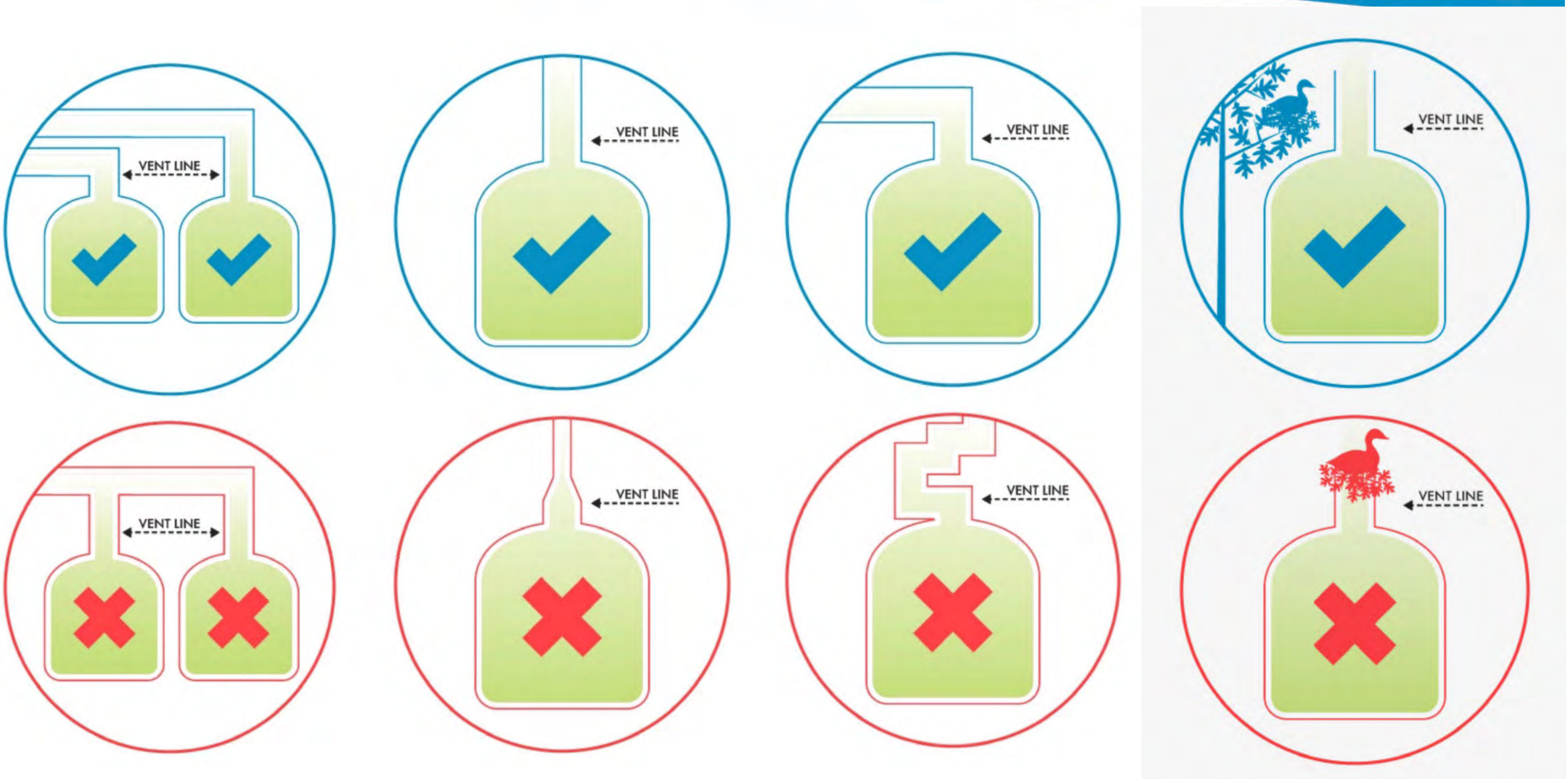
- Crosslinked HD Polyethylene
- FRP – Fiberglass
- OR-1000 Resin System
- Full Drain Tanks
- Double Walled Tanks
- **Venting / Flex Couplings**

DO NOT REDUCE/RESTRICT VENTING

Otherwise,
Possible:
- **Tank failure...**
- **Serious injury or death**

Need Help?
PPC Installation Manual
www.polyprocessing.com/venting
800-523-9871

Mechanical Pump Fill	Pneumatic Fill								
IF ≤ 1,000 gallons	IF – Vent length ≤ 3'			IF – Vent length ≥ 3' and ≤ 30'			IF – Scrubber application		
✓ Vent size should equal size of largest fill or discharge fitting	✓ Maintain vent screen mesh size ≥ ¼" or no screen used ✓ Emergency Pressure Relief Cover Required IF > 1,000 gallons			✓ 3 or less 90° elbows with no other restrictions or reduction in pipe size ✓ Emergency Pressure Relief Cover Required IF > 1,000 gallons			✓ Vent pipe size throughout scrubber system CANNOT be reduced! ✓ Centerline of dispersion pipe not to be submersed > 6" ✓ Perforated dispersion pipe must be same diameter as vent or larger. Sum of perforations ≥ cross-sectional area of pipe		
IF > 1,000 gallons	Tanker Discharge	Inlet/Fitting Size	**Minimum Vent Size**	Tanker Discharge	Inlet/Fitting Size	**Minimum Vent Size**	Tanker Discharge	Inlet/Fitting Size	**Minimum Vent Size**
✓ Vent size should exceed the largest fill or discharge fitting by 1"	2"	2"	**4"**	2"	2"	**6"**	2"	2"	**6"**
	3"	2"	**6"**	3"	2"	**6"**	3"	2"	**8"**
	3"	3"	**6"**	3"	3"	**8"**	3"	3"	**10"**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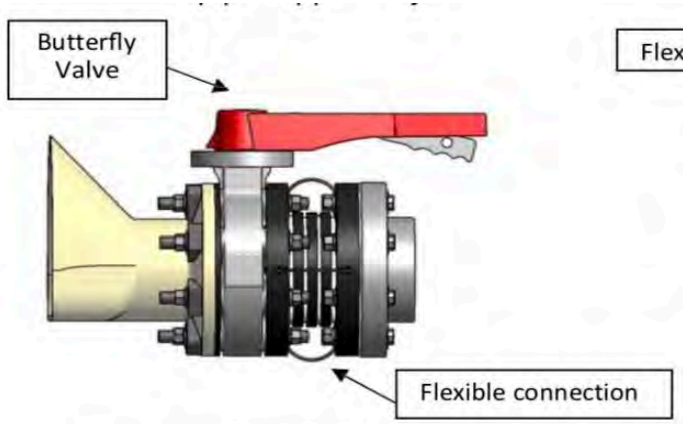
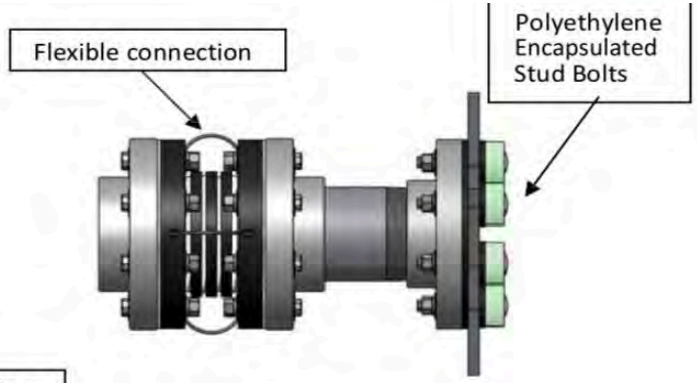


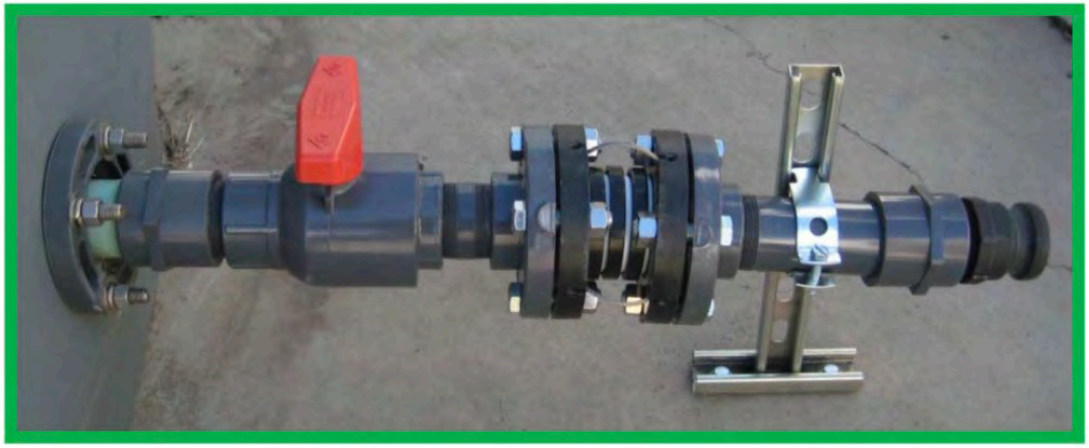
Flexible connection installed on IMFO® flange (Optional Flange Mate Shown)

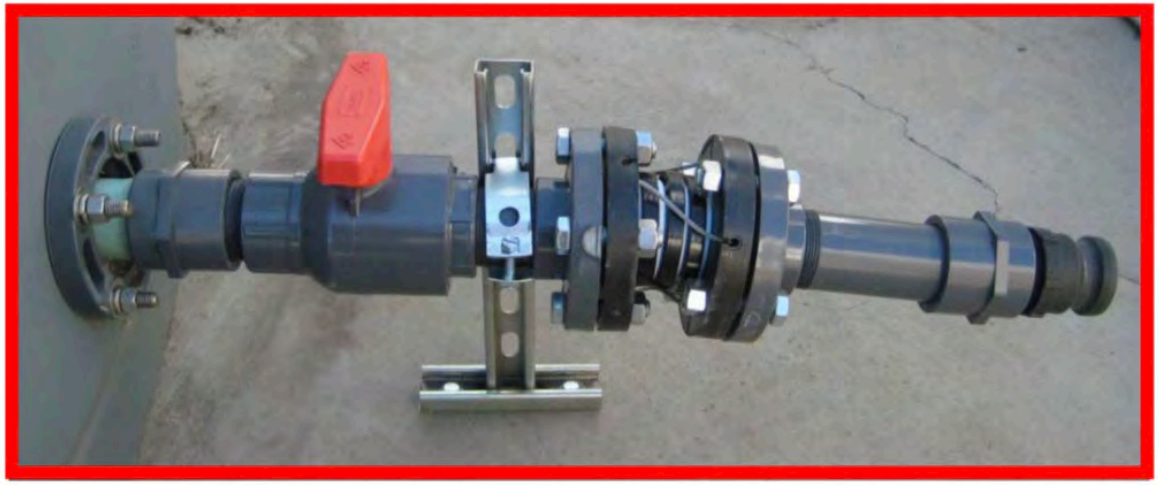


Flexible connection installed near tank sidewall (Optional Flange Mate Shown)

Flexible Connection Minimum Specifications:

- Axial Compression ≥ 0.67”
- Axial Extension ≥ 0.67”
- Lateral Deflection ≥ 0.51”
- Angular Deflection ≥ 14°
- Torsional Rotation ≥ 4°





NSF/ANSI Standard 60: Drinking Water Treatment Chemicals

- ***Requirements for chemicals that are used to treat drinking water.***

NSF/ANSI Standard 61: Drinking Water System Components

- ***Requirements for all devices, components and materials that come into contact with drinking water.***

Acetic Acid ≤ 80%
Aluminum Chlorohydrate
Aluminum Sulfate ≤ 50%
Calcium Carbonate
Calcium Chloride ≤ 30%
Chlorine Dioxide ≤ 38%
Citric Acid
Copper Sulfate ≤ 25%
De-ionized Water
Ferric Chloride ≤ 50%
Ferric Sulfate ≤ 60%
Ferrous Chloride ≤ 37%
Ferrous Sulfate ≤ 30%
Hydrochloric Acid ≤ 37%
Hydrofluoric Acid ≤ 52%
Hydrofluorosilicic Acid ≤ 30%
Hydrogen Peroxide ≤ 10%
Liq. Ammonium Sulfate ≤ 45%
Magnesium Chloride ≤ 35%

Peracetic Acid 10%
Phosphoric Acid ≤ 75%
Poly Alum. Chloride
Polyorthosphosphate
Potable Water
Potassium Hydroxide ≤ 50%
Potassium Permanganate ≤ 4%
Sodium Aluminate
Sodium Bisulfite ≤ 40%
Sodium Carbonate ≤ 85%
Sodium Chloride ≤ 26%
Sodium Chlorite ≤ 34%
Sodium Hydroxide ≤ 50%
Sodium Hypochlorite ≤ 15%
Sodium Hypochlorite ≤ .8%
Sodium Permanganate ≤ 40%
Sodium Silicate
Sulfuric Acid ≤ 98%
Zinc Orthophosphate

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- **Instant Access to Engineered Specifications**
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- **Fittings and Accessory Applications**
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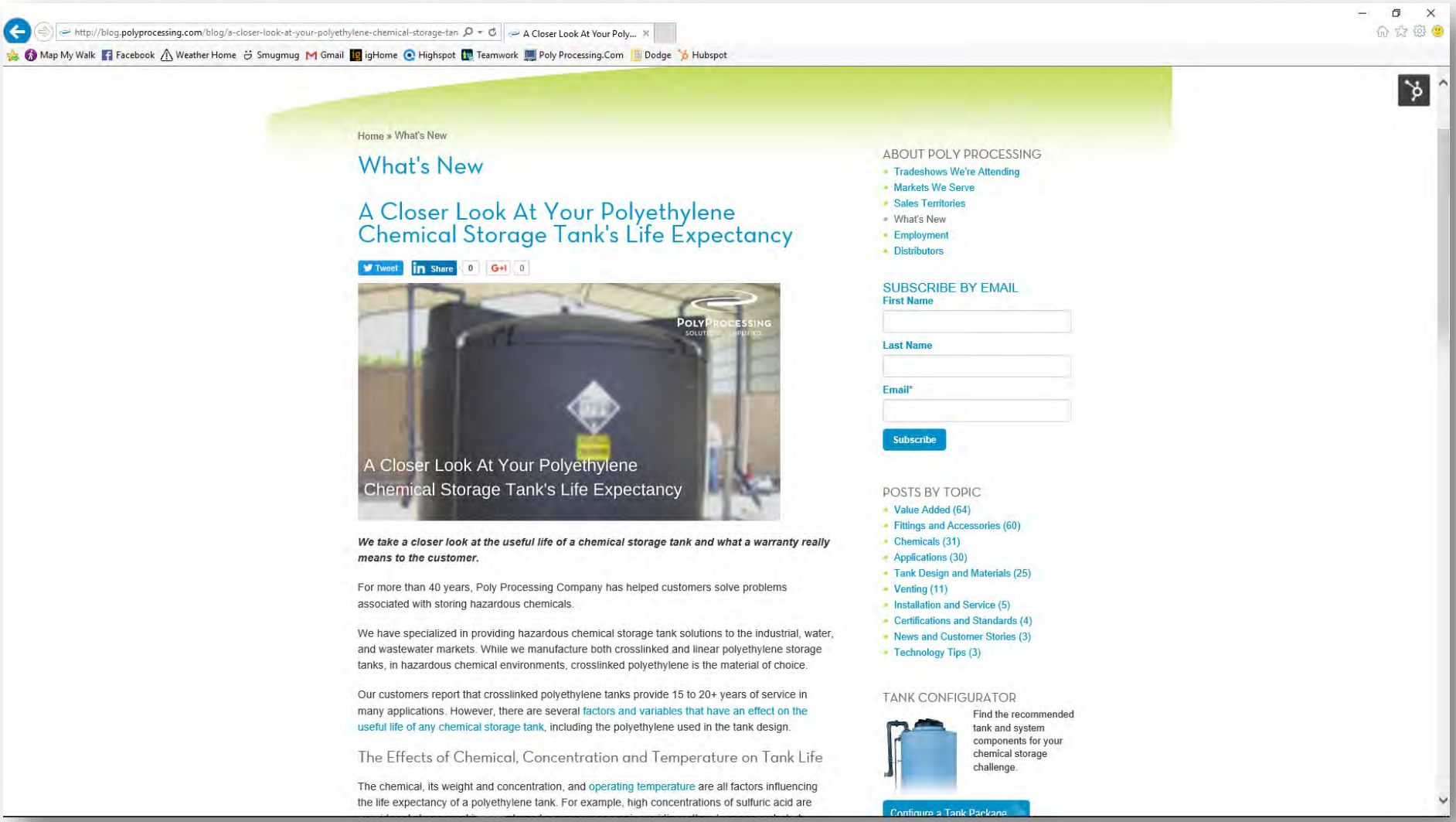
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POLYPROCESSING
A Closer Look At Your Polyethylene Chemical Storage Tank's Life Expectancy
We take a closer look at the useful life of a chemical storage tank and what a warranty really means to the customer.
For more than 40 years, Poly Processing Company has helped customers solve problems associated with storing hazardous chemicals.
We have specialized in providing hazardous chemical storage tank solutions to the industrial, water, and wastewater markets. While we manufacture both crosslinked and linear polyethylene storage tanks, in hazardous chemical environments, crosslinked polyethylene is the material of choice.
Our customers report that crosslinked polyethylene tanks provide 15 to 20+ years of service in many applications. However, there are several factors and variables that have an effect on the useful life of any chemical storage tank, including the polyethylene used in the tank design.
The Effects of Chemical, Concentration and Temperature on Tank Life
The chemical, its weight and concentration, and operating temperature are all factors influencing the life expectancy of a polyethylene tank. For example, high concentrations of sulfuric acid are
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News and Customer Stories (3)
Technology Tips (3)
TANK CONFIGURATOR
Find the recommended tank and system components for your chemical storage challenge.
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Helping Our Customers…

- ***Smart Solutions for Chemical Storage***
- ***Safety made Easy***
- ***Tangible Value***

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SOLUTIONS, SIMPLIFIED.

Thank You