

# What is ePTFE?



# Expanded Polytetrafluoroethylene

## *Expanded*

- Refers to the mechanical state of the material.
- Expansion process, innovated by W.L. Gore & Associates, is what makes GORE products so unique. *(We'll come back to that in a moment...)*

## *Polytetrafluoroethylene (or PTFE)*

- Chemical name for a unique plastic with extraordinary material properties.
- Most commonly known for its use as a material within the DuPont Teflon® brand of non-stick cookware.



# Discovery of PTFE

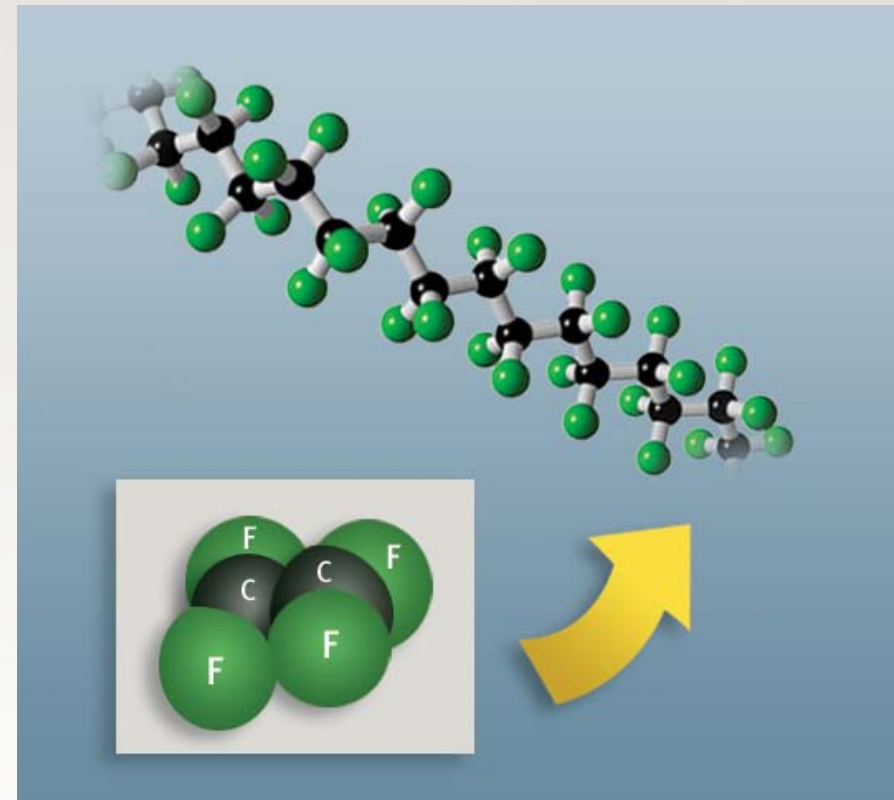
- Discovered in 1938 by Roy Plunkett; an unintended consequence of a “failed” refrigeration gas experiment.
- Revolutionized plastics industry, and led to countless new innovations.



Roy Plunkett (on the right), reenacts discovery of PTFE powder with assistants Jack Rebok (left) and Bob McHare

# Polymerization of Tetrafluoroethylene

- PTFE is produced by polymerization of a  $C_2F_4$  (tetrafluoroethylene) monomer to produce a very long chain macro molecule.
- The Carbon-Fluorine chemical bond is the strongest known producing superior protection against chemical attack.



# Properties of PTFE

## Advantages

- Chemically inert to nearly all media (pH 0-14)
- Wide range of thermal resistance
  - -268°C to +315°C (-450°F to +600°F)
- Non-aging, weather and UV resistant
- Low coefficient of friction
- Physiologically harmless
- Wide application versatility

## Disadvantage

- Mechanically weak



## Discovery of expanded PTFE

In 1969, Bob Gore discovered expanded PTFE.

Unique process significantly improved the ***mechanical*** properties while maintaining all the positive chemistry attributes of the base PTFE material.



# Gasket Performance Benefits of ePTFE

Improved mechanical properties offer key advantages over other PTFE materials. GORE® gaskets more reliably withstand the harsh environment of dynamically operated bolted flange connections:

- Highly conformable to achieve incredible tightness
- Capable of sealing damaged flange surfaces
- Resistance to creep and cold flow
- Superior blowout and high temperature resistance
- Longer service life without the need for retorque
- Superior reliability performance

