History of Roofing

• Roofing and shelter
• Early roofing
• Beginning of present-day roofing
• Roofing today
Beginnings

- Caves
- Tree Bark
- Grass
- Animal Skin
- Thatch - Sticks and leaves or palms
Roofs in some ancient cultures were as diverse as they are today.

• Egyptian roofs were made of stone slabs
• Greek & Roman cultures often used clay tiles on timber trusses.
• English countryside houses utilized thatch
Early Americas 1600 - 1900

- 1600’s - Wood in Virginia
- 1650’s - Slate in Boston
- 1760’s - Copper in New York
- 1800’s - Tinplate
- 1810’s - Zinc
- 1860’s - Galvanized steel
- 1890’s - Aluminum/Tern plate

Note: Most early roofs were water shedding!
Built-up Roofing Begins (BUR)

- 1840 - Paper, pine tar and sand
- 1844 - Warren Roofing begins in Ohio
- 1847 - Coal Tar and saturated felt begin
- 1848 - Barrett Roofing begins in Chicago
- 1858 - H.W. Johns starts
Early BUR- 1850 to 1900

• 1868 - Slag introduced
• 1871 - Chicago fire: 17,450 buildings burn. 3.3 sq. miles. Majority of the buildings had shingle roofs or tar flat roofs.
• 1870’s - Barrett markets 5 ply tar/paper & slate against wood shingles
• Roofing Specifications
• Roofing Articles
BUR – Early 1900’s

• 1911 - 165,000 buildings. Flying brands
• 1916 - UL introduces classes A to H (A, B & C today)
• 1916 - Roof Bonds Introduced
• 1920’s - Asbestos felts introduced
BUR – 1930 – 1950’s

• Late 1930’s - Asphalt Introduced
• 1941 - Dow trial IRMA in Michigan
• Late 1940’s - Glass fiber felts introduced
• 1953 - Livonia fire leads to FM research & development of UL 1256 & ULC S126
Oil Refining

- Crude oil is processed in a fractionating column.
- Fractions decrease in density and boiling point as they move up the column:
  - C1 to C4 gas
  - C5 to C9 naphtha
  - C5 to C10 paraffin oil (gasoline)
  - C10 to C16 kerosene
  - C14 to C20 diesel oils
  - C20 to C50 lubricating oil
  - C20 to C70 fuel oil
  - >C70 residue
- Products are produced at different temperatures:
  - 20°C: liquefied petroleum gas
  - 70°C: C5 to C10 paraffin oil (gasoline)
  - 120°C: C10 to C16 kerosene
  - 170°C: diesel fuels
  - 270°C: lubricating oils, waxes, polishes
  - 600°C: fuels for ships, factories and central heating
- By-products are:
  - Bitumen for roads and roofing
  - Chemicals
  - Petrol for vehicles
  - Jet fuel, paraffin for lighting and heating
BUR – 1960’s

• 1960’s - Rag replaced with pulp (paper)
• 1961 - Cold process BUR introduced
• Glass & polyester reinforcements introduced
BUR – 1970’s

• 1972 - Hot applied rubberized asphalt
• 1972 - Oil embargo - poor quality asphalt
• 1972 - Insulation requirements increase
Single Ply Membranes

• 1957 - Neoprene at Yale arena
• 1963 - Butyl by Miner Mfg. of Granby
• 1965 onward - PVC, PIB, CPE, CSPE
• 1990’s - TPO & EP
• 1970’s - Extended warranties
• 1980’s - Extended guarantees
Insulation

• 1941 - Extruded polystyrene
• 1952 - Wood fiber
• Mid 1950’s - Perlite and Foamglass
• 1960’s - Cork
• 1956 - Glass fiber
• 1960’s - Expanded Polystyrene
Insulation (cont’d)

• Late 1960’s - Urethane board stock
• 1969 - Open cell phenolic
• Late 1970’s - Polyisocyanurate Foam
• 1981 - Mineral Fiber
• 1983 - Closed cell phenolic
Summary

Today: The Roof Observer is required to know specifics on many roof systems, combinations, codes and Regulations

A CHALLENGING JOB!
Questions and Discussion