Sucker Rods
Rod Strings

- Transmits energy from a surface pumping unit to a bottom hole pump
- The most critical component of any reciprocating rod system
- Important considerations:
  - Cyclic loads
  - Corrosive and abrasive environments
  - Coupling/tubing wear
  - Flow restriction in tubing
  - Proper make-up of couplings
  - Proper handling and storage
Types of Rod Strings

• Jointed Sucker Rods
  – Conventional API Sucker Rod
  – Special service Non-API sucker rods for special applications
  – Hollow sucker rods
  – Fiberglass sucker rods
  – High strength connections

• Continuous Rods
American Petroleum Institute
General Dimensions of Rods and Couplings

• **Rods:**
  - Are available in 25 and 30 foot lengths
  - Male connections on each end
  - Connected together with couplings
  - Rod diameters available in 5/8-in to 1-1/2-in measured in 1/8-in increments
  - Pony rods are available in 2, 4, 6, 8 and 10 foot lengths

24 ft 8 in or 29 ft 8 in ft ± 2 in
API Nomenclature for Sucker Rods

- API rod number is the diameter in 1/8” increments. Examples:
  - 3/4-in. rod = 6/8 in. = “6” rods
  - 1-in. rod = 8/8 in. = “8” rods

- API designates *tapered* strings by the largest and the smallest rod numbers in the taper. Examples:
  - 7/8-in. and 3/4-in. in taper is designated as “76”
  - 1-in., 7/8-in., 3/4-in. in taper designated as “86”
  - 1” rod string would be a “88” string.
API and Non – API Sucker Rod Grades

- **API Sucker Rod Grades**
  - **C** – Carbon steel
    - Minimum tensile – 90,000 psi
  - **K** – Alloy steel
    - Minimum tensile – 90,000 psi
  - **D** – Carbon and alloy steel
    - Minimum tensile – 115,000 psi

- **Non – API Rods**
  - High Strength – Alloy steel
  - Minimum tensile typically 140,000 psi
Rod Guide Designs

- Standard Designs
  - Used to Mitigate Wear or Paraffin Removal
    - Straight Vane
    - Slant Vane
    - Double Action
      - Used to Remove Paraffin From Rods and Tubing

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**Sucker Rod Accessories - Sinker Bars**

- **Positive Features**
  - Helps keep rods in tension on down stroke
  - Assist the rod pump and sucker rod string fall
  - Helps to balance the Surface Unit
  - Reduces rod and tubing wear and reduces load range

- **Negative Features**
  - Cost can become a factor
  - If sinker bar selected with an elevator neck, the neck becomes weakest leak of the bar
  - Bad design selection of sinker bars can cause more harm then good by overloading system
  - Extremely difficult to fish when parted