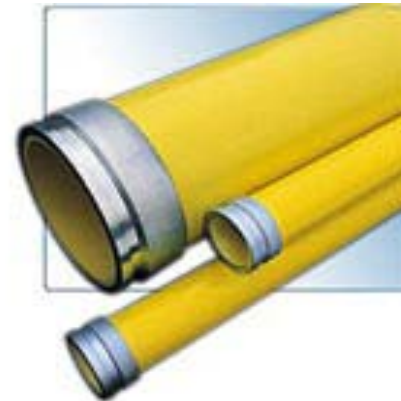


# DPI Plastics; Committed to Providing Quality Mining Products & Maintaining Integrity



# PVC Mining Pipe History

- Developed in conjunction with Mining Engineers specifically for mines
- Mineflo water pipe introduced in 1980
- Air Pipe introduced in 1986, supplied more than 100 000 meters since
- Many advantages, including light weight, energy efficiency, compatibility with other systems
- Supplied to most mining houses



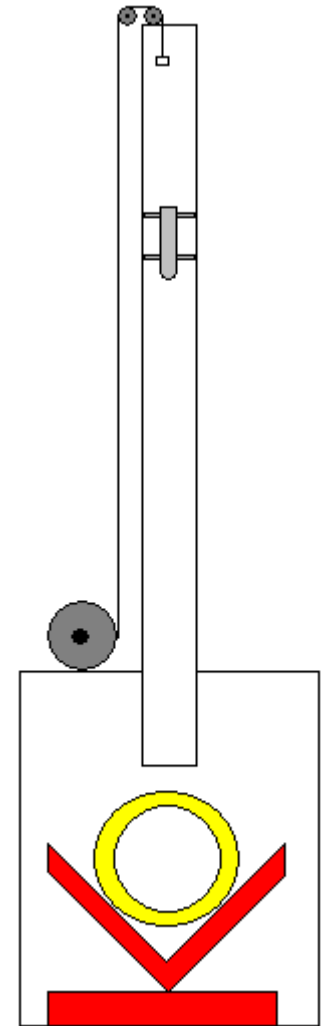
# Investigation

- Standard tests conducted – Pressure, gelation, impact, dimensions
- Investigation under ground – Root cause?
  - Retention of samples
- Use of risk assessment to establish root cause
  - Handling of pipes
  - Storage of pipes
  - Suspension of pipes
  - Operation of pipe columns



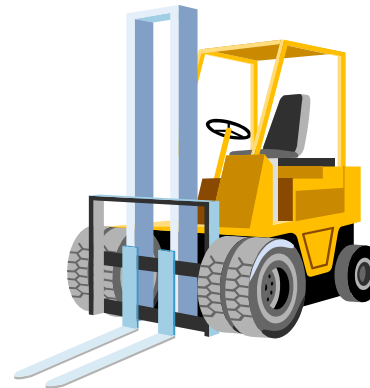
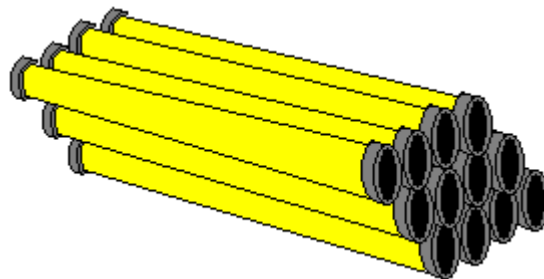
# Handling of Pipes

- Possibility of crack / notch creation by physical damage
- Damage to steel collars - leaking
- Knocking of pipe / collar with hammer
  - Simulation test with 4 pound hammer
  - Test repeated with strikers of various masses



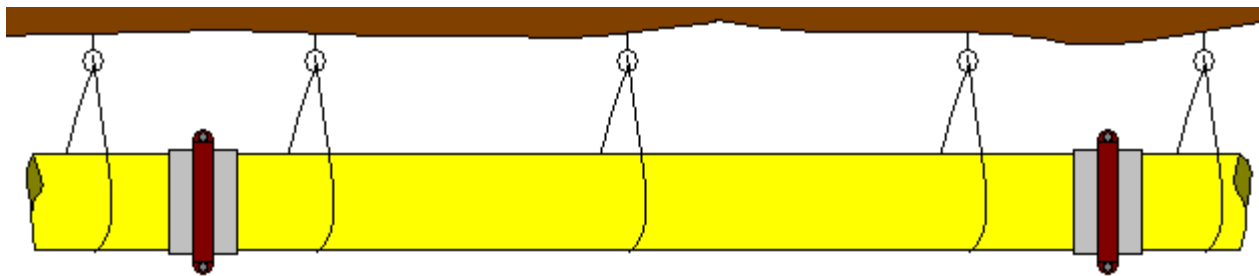
# Storage of Pipes

- Possibility of UV attack leading to weakening of pipes
  - Effect of UV attack on Plastics
- Testing programme on discoloured pipes from various mines
  - High burst pressures achieved
  - Ductility adequate
- Risk assessment recommendations regarding storage



# Suspension of pipes

- Risk assessment recommendations
- The effect of compound stresses and point loads
- Consideration for additional loads on the pipe
  - Fittings
  - Second column suspended from the first
  - Temporary loads



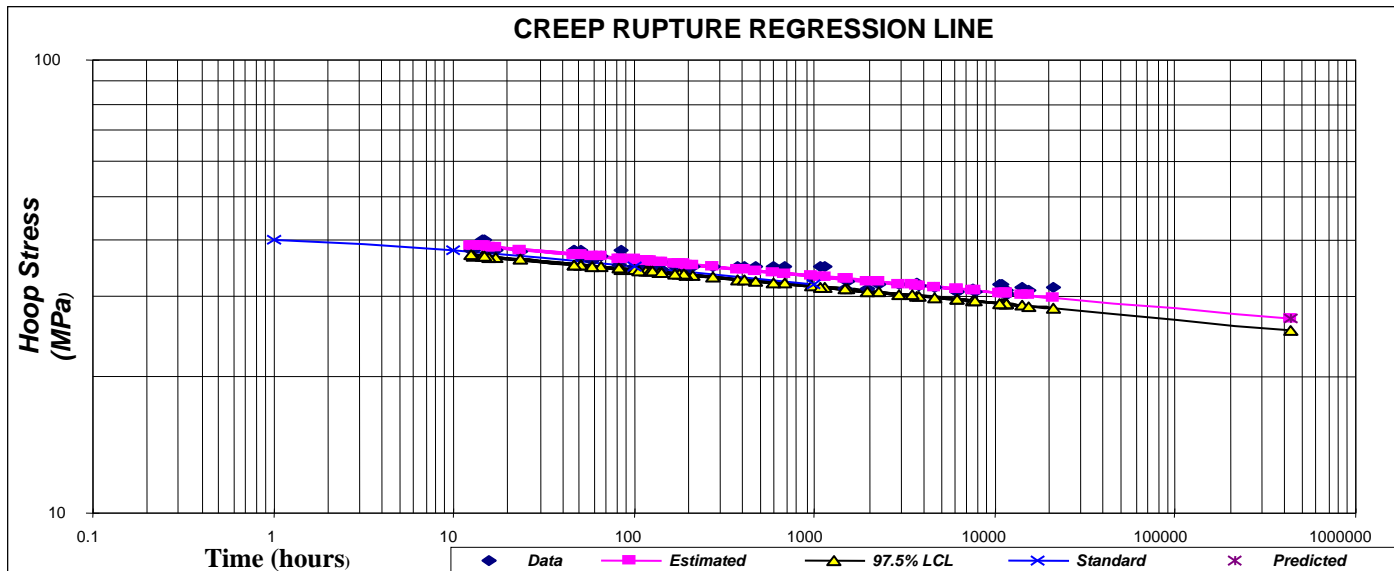
# Operation of Pipe Columns

- Charging of pipe columns
  - Stand clear of charging columns
  - Operating of valves
  - Repairs to leaking pipe joints
  - Expansion / Contraction



# Design of Airflo Pipes

- Class 7 Airflo has approximately Class 12 Water pipe wall thickness
- This results in a 2 times safety factor at 30° C
- Burst pressure above 30 Bar
- Regression analysis completed



# Design of Airflo Pipes

- Airflo pipes are specially formulated to enhance ductility and improve RCP
- Tensile strength of 30 MPa retained
- Ductility improves resistance to point loads and compound stresses
- Focus on Quality and Safety, rather than price



# Testing of Airflo Pipes

- Tested to SANS 1283 principles
- Increased severity level of critical tests
- Additional testing of raw material dry blends
- Batch identification and records available
- Research and simulative testing



# Questions?

