

**KNORR SYSTEMS, INC.  
PRESENTS:**

# **Optimizing Your Existing Chemical Treatment Equipment**

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# Introduction

- 1) What is the expected life of equipment exposed to pool chemicals?
- 2) What should you look for?
- 3) What factors contribute to shortened equipment life?
- 4) What can be done to maximize this purchase?
- 5) Is the cost of preventive maintenance justified?

# Chemical Controllers



- Clean sensors when prescribed or when you start to see irregularities.
- Routinely confirm operation of sample water flow-switch

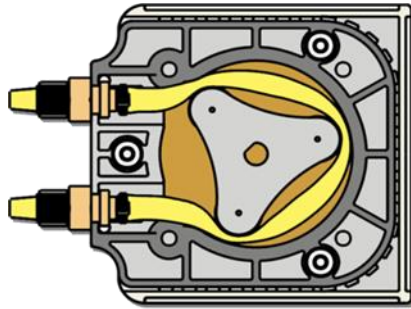


# Chemical Feed Systems

1. Liquid chemicals
  - a) Metering pumps
  - b) Venturi systems
  
2. Dry chemicals
  - a) Erosion feeders
  - b) Dissolving feeders
  
3. Gas chemical systems
  - a) Venturi systems
  - b) Pressure systems
  
4. Salt chlorination systems

# Liquid chemical feeders

Metering pumps:



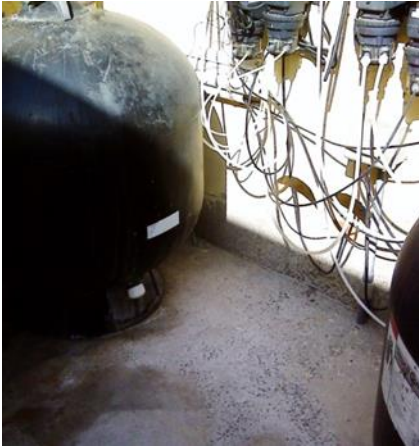
Peristaltic style



Diaphragm style

# Problem:

## Storage and sealing of chemical vapors





# Solutions to Fuming:

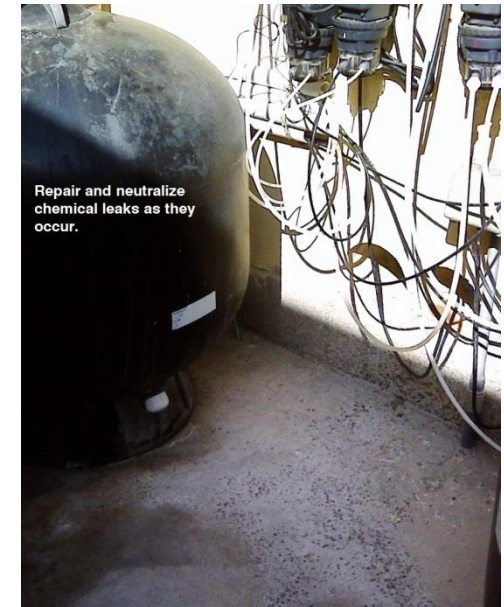


# Chlorine Injector Cleaning:





# Things to look for:





# Metering pump maintenance:

1. Replace tubing once a year
2. Rebuild diaphragm pumps once a year (minimally, replace diaphragm)
3. Replace peristaltic feed tubes quarterly
4. Clean injection-check valves routinely
5. Monitor and maintain storage tanks to keep fuming in check
6. Repair chemical leaks immediately and neutralize leaked materials

# Chemical Tubing versus Hard-piping

Best Practices:

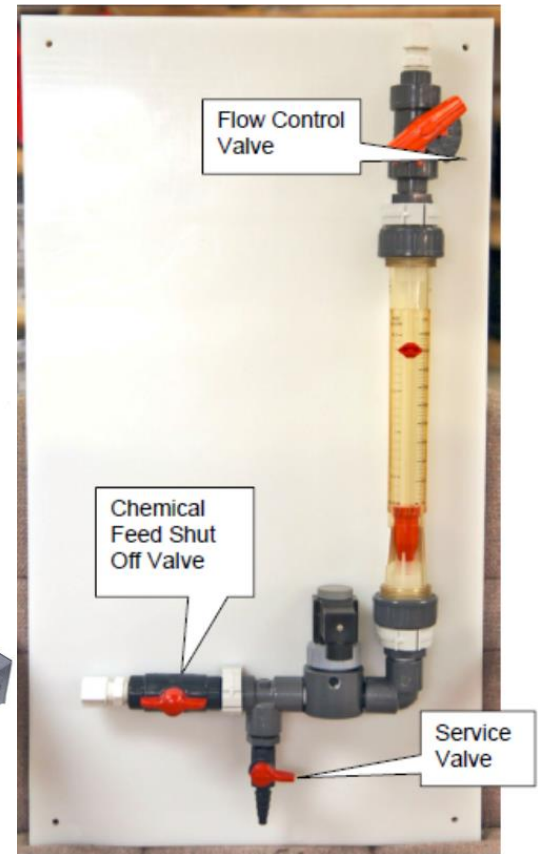
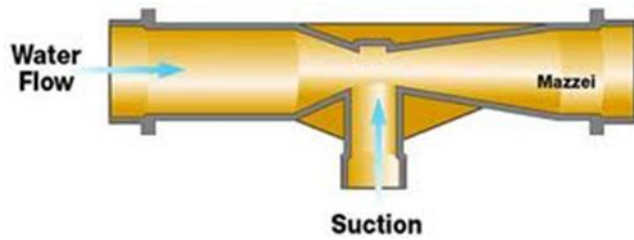




# Something to consider:



# Venturi Feed Systems







# Venturi feed maintenance:

1. If feeding high pH product, routinely clean venturi with acid solution as directed by manufacturer
2. Follow specific manufacturer maintenance guidelines for other aspects of equipment maintenance

# Dry Chlorine Feed Systems



Flow erosion type



Spray erosion type



# Dry chlorine feed maintenance:

1. If feeding high pH product, routinely clean venturi with acid solution as directed by manufacturer (the same goes for feed device)
2. Follow specific manufacturer maintenance guidelines for other aspects of equipment maintenance
3. Always be cautious when cleaning equipment with acid solutions (mechanically remove as much scale as possible and rinse thoroughly prior to adding acid)
4. Wear personal protection gear when working with chemicals

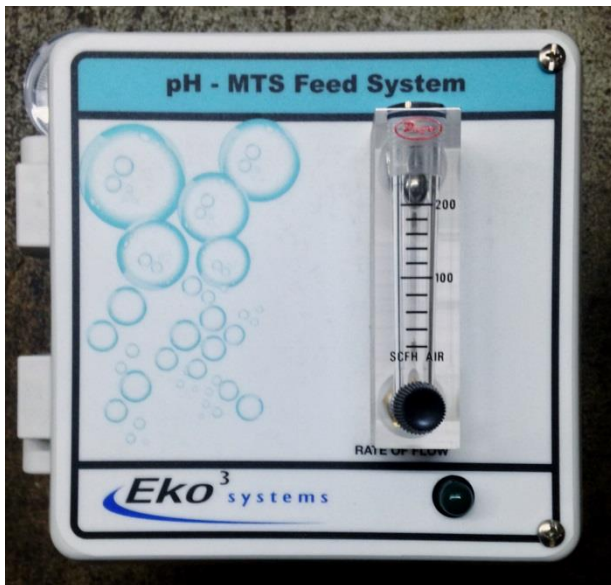
# Gas Chemical Systems

Gas chemicals for your pool

Gas chlorine

Carbon dioxide (CO<sub>2</sub>)

Venturi versus Pressure Systems



# Vacuum systems



- Higher chemical efficiency = less product cost
- Lowest pH created is 5.0
- Total alkalinity control is easily added



# Pressure systems



- Inexpensive to purchase
- Lowest pH created is 6.8 (carbonic acid)

# Carbon dioxide storage



- Liquid CO<sub>2</sub> in cryogenic tanks



- High pressure tanks



# Conclusion:

The daily operation of our aquatic facilities as well as the public health of our patrons depends upon these systems functioning at optimum levels.

“Pay me now or pay me later” is a very true adage in the world of chemical feed systems.

Identifying problems and smaller issues on the way to becoming problems can save your facility money in both repairs and impacted programming.