



* Chemical Storage,
Safety, and
Handling

*Introduction

Hawkins Water Treatment Group

- 34 branches from Montana to Florida
- We utilize a route/salesperson approach
- Supply products and equipment to treat drinking water, municipal and industrial wastewater, industrial process water and non residential swimming pools
- Hawkins has been in business since 1938

*Topics of Discussion

- Chemicals
- Storage
- Handling
- Safety Equipment
- Updating Equipment

*Chemicals

Gas Chlorine:

- Greenish-yellowish in color
- 2 ½ times heavier than air
- One volume of liquid chlorine expands to 460 volumes of gas
- Chlorine is only slightly soluble in water
- Only small amount can overcome your breathing.
- at -30 degrees it will no longer gas off
- at around 165 degree fusible plug will melt
- Combines moisture to form hypochlorous acid
 - Causes burns
 - Causes fluid buildup - pneumonia
 - Never go check chlorinators alone

Slide 4

MC1

Mike Clemens, 1/26/2021

- Chlorine is used in plastics, insecticides pharmaceuticals, and disinfection.
- 110 year anniversary in 2018 for use as water disinfection in the US
- Majority of chlorine is used in manufacturing
- Disinfection is actually a small percentage of chlorine production



- * 3-8 ppm Slight irritation of nose, upper respiratory tract and eyes
- * 15-20 ppm Immediate severe irritation and choking (This environment is too irritating to remain in voluntarily)
- * 30 ppm Chest pain, nausea and vomiting
- * 40 ppm Chemical bronchitis, fluid in the lungs may develop, and possible chemical pneumonia several days later
- * 50+ ppm Prolonged exposure will result in suffocation and death

* Chemical Contact

Sodium Hypochlorite:

- Light yellow in color
- pH between 12-13.5
- Corrosive
- Freezes at -15 degrees
- Chlorine stays in water due high pH of Caustic Soda
- Keep away from low pH Chemicals(Acids)

Acids:

- Hydrochloric Acid, Sulfuric Acid
- Hydrofluosilicic Acid(Fluoride)
- Clear in color
- Highly Corrosive
- Low pH at or around 1 to 2
- Very dangerous to skin and eyes; burning and scarring
- Can major damage to your cement floors

Caustic Soda(Sodium Hydroxide):

- Clear in Color
- Highly Corrosive
- High pH around 14 (Alkali)
- Very dangerous to skin and eyes; burning and scarring



pH SCALE COMPARISONS



*Storage

150 lb cylinders or Ton Cylinders

5 , 15, 30 or 55 gallon containers

Mini-Bulk with day tanks

What you decide to use depends on you and what is useful to your situation.

- Space
- How much do you use?
- Equipment
- Training

- Containment Tanks
- Hoses
- Compatibility (Corrosive vs. Corrosive)
- Signs and Labels
- Leaks
- Venting
- Housekeeping

 **Storage**

CHECK LABELS ON CHEMICAL CONTAINERS



EVERY CHEMICAL CONTAINER MUST HAVE A WARNING LABEL

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HEALTH:	
FLAMMABILITY:	
REACTIVITY:	
OTHER:	B GLASSES AND GLOVES

DO NOT FREEZE **HANDLING AND STORAGE**

STORE IN A DRY, COOL PLACE (5-30 DEGREES C)
 AVOID CONTACT WITH SKIN AND EYES.
 WASH HANDS BEFORE BREAKS AND AT THE END OF WORKDAY
 KEEP CONTAINER CLOSED WHEN NOT IN USE
 EMPTY CONTAINERS MAY CONTAIN RESIDUAL PRODUCT
 DO NOT REUSE CONTAINER UNLESS PROPERLY RECONDITIONED
 KEEP AWAY FROM HEAT, OPEN FLAME,
 OR OTHER SOURCES OF IGNITION

NET WEIGHT 450 LBS
 MADE IN U.S.A.

FIRST AID

EYE- FLUSH WITH PLENTY OF WATER
 SKIN- WASH THOROUGHLY WITH SOAP AND WATER
 INHALATION- REMOVE TO FRESH AIR
 INGESTION- CONTAINS PETROLEUM DISTILLATE
DO NOT INDUCE VOMITING
 CALL PHYSICIAN OR POISON CONTROL CENTER
 NEVER GIVE ANYTHING BY MOUTH
 TO AN UNCONSCIOUS PERSON

IF SYMPTOMS PERSIST, SEEK MEDICAL ATTENTION



760267 L1 N1
 LOT RA40/1208M PALLET 040

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14-50



Have your SDS sheets available and near by

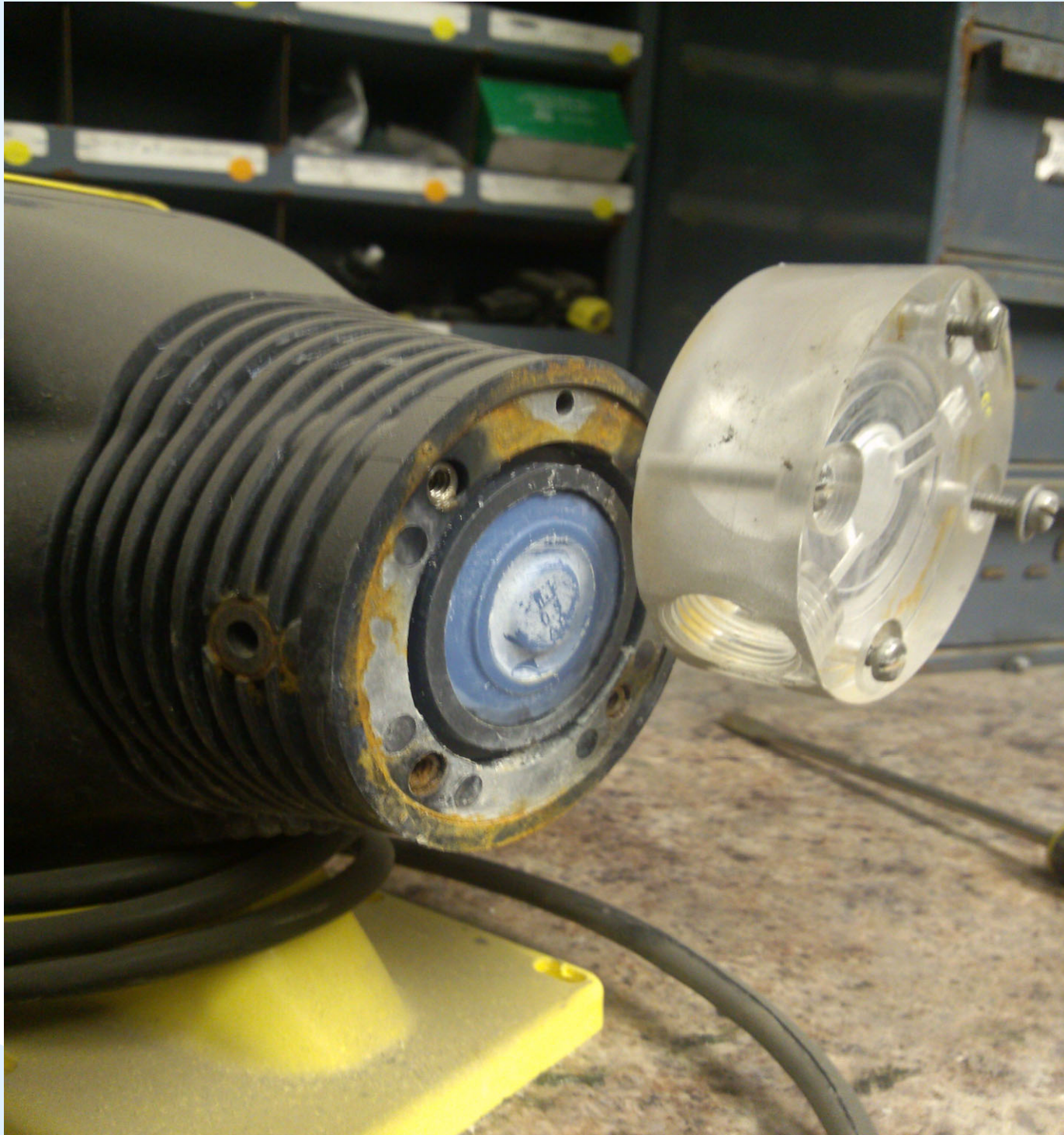
Know your Chemicals

Limit your handling

Safety Equipment

 **HANDLING**







*Safety Equipment

- Chain Cylinders
- Leak Detectors-Alarms
- Automatic Shutoff Valves
- Gas Masks / Changing Cylinder Instructions
- Gloves and Aprons and Glasses
- Eye Wash Stations
- Drum Carts and Own Hoses
- Day Tanks and Containment
- B/A Conditioner
- Spare Parts for all equipment

- * Captures and absorbs vented chlorine gas.
- * Self contained
- * Non-hazardous and no special disposal provisions
- * Indicator strips show when a venting condition occurs and when the media has expired

* Vent Arrest





* Automatic shut-off systems









* Updating Equipment

- * Reduce your handling anyway possible
- * Replace tanks that are 10-12 years old
- * Replace Tubing
- * Preventive Maintenance on pumps & chlorinators
- * If mixing or diluting look into pumps that would help you to avoid this procedure.
- * Signs and Labels
- * Plenty of spare parts on hand to avoid downtime.
- * Dry Erosion Feeders in certain circumstances
- * Mini-Bulk

The SDS is the international form of the Material Safety Data Sheet (MSDS). While the MSDS came in multiple formats, the SDS is published in only one format. That format consists of a specific order and set of headlines. That information and order is as follows:

Section 1: Identification

Section 2: Hazard

Section 3: Composition

Section 4: First-Aid

Section 5: Fire Fighting

Section 6: Accidental Release

Section 7: Handling/Storage

Section 8: Exposure Controls

Section 9: Physical/Chem. properties

Section 10: Stability/Reactivity

Section 11: Toxicology Information

Section 12: Ecological

Section 13: Disposal

Section 14: Transport

Section 15: Regulatory

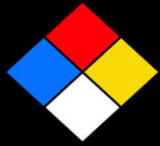
Section 16: Other information



MSDS of SDS

Employers can obtain new Safety Data Sheets from the manufactures they purchase hazardous chemicals from.





NFPA Rating Explanation Guide



HEALTH HAZARD

- 4 = Can be lethal
- 3 = Can cause serious or permanent injury
- 2 = Can cause temporary incapacitation or residual injury
- 1 = Can cause significant irritation
- 0 = No hazard

FLAMMABILITY HAZARD

- 4 = Will vaporize and readily burn at normal temperatures
- 3 = Can be ignited under almost all ambient temperatures
- 2 = Must be heated or high ambient temperature to burn
- 1 = Must be preheated before ignition can occur
- 0 = Will not burn

- ALK = Alkaline
- ACID = Acidic
- COR = Corrosive
- OX = Oxidizing
- = Radioactive
- = Reacts violently or explosively with water
- = Reacts violently or explosively with water and oxidizing

- 4 = May explode at normal temperatures and pressures
- 3 = May explode at high temperature or shock
- 2 = Violent chemical change at high temperatures or pressures
- 1 = Normally stable. High temperatures make unstable
- 0 = Stable

SPECIAL HAZARD

INSTABILITY HAZARD

This chart for reference only - For complete specifications consult the NFPA 704 Standard

- * Reduce Handling
- * Placards, Signs and Labels
- * Product Separation and Segregation
- * Safety
- * Training
- * Work Smarter and not Harder

***What This Means**