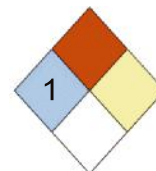


Antimicrobial Pesticides and Respirators

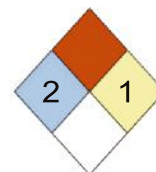
Sodium hypochlorite 5-6% liquid – childcare (and other) antimicrobial pesticide

VENTILATION: none required
RESPIRATORY: none required
EYE/FACE: goggles or face shield when handling
SKIN: goggles when handling; wash thoroughly after handling
DECOMPOSITION: not significant



Sodium hypochlorite 10-16% liquid – pool antimicrobial pesticide

VENTILATION: local mechanical exhaust ventilation to minimize exposure to vapors or mist at the point of use
RESPIRATORY: NIOSH/MSHA-approved respirator – acid gas cartridge for exposure to mist concentration at the point of use
EYE/FACE: chemical goggles and full face-shield unless a full face-piece respirator is also worn
SKIN: long-sleeved shirt, trousers, rubber boots, rubber gloves, and rubber apron
DECOMPOSITION: contact with acids, ammonia, ether, oxidizing or reducing agents releases toxic vapors



Calcium hypochlorite 65% tablet – pool antimicrobial pesticide

VENTILATION: none needed unless dusty
RESPIRATORY: NIOSH/MSHA-approved respirator – acid gas cartridge, dust pre-filter
EYE/FACE: splash goggles; eyewash station required
SKIN: gloves, boots, aprons, or chemical suit as necessary
DECOMPOSITION: contact with acids or ammonia releases toxic vapors



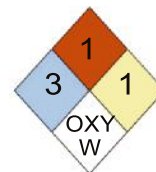
Calcium hypochlorite 65% granular – pool antimicrobial pesticide

VENTILATION: local exhaust
RESPIRATORY: NIOSH/MSHA-approved respirator – acid gas cartridge, dust pre-filter
EYE/FACE: splash goggles; eyewash station required
SKIN: appropriate clothing to prevent skin exposure
DECOMPOSITION: contact with acids or ammonia releases toxic vapors



Bromine 65% tablet – pool antimicrobial pesticide

VENTILATION: none needed unless dusty
RESPIRATORY: NIOSH/MSHA-approved full-face respirator – chemical cartridge (chlorine), dust pre-filter
EYE/FACE: safety glasses or goggles; eyewash station required
SKIN: gloves, boots, aprons, or chemical suit as necessary
DECOMPOSITION: contact with acids or ammonia releases toxic vapors; contact with water creates extreme heat



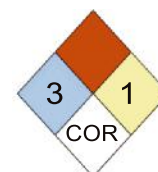
Chlorine (Cl₂) gas compound; usually mixed with Nitrogen – pool antimicrobial pesticide

VENTILATION: positive local ventilation; must maintain O₂ above 19.5%
RESPIRATORY: up to 5 ppm – NIOSH/MSHA-approved respirator – acid gas cartridge
up to 10 ppm – Supplied Air Respirator (SAR), Powered Air Purifying Respirator (PAPR) with chlorine cartridge, or Self-Contained Breathing Apparatus (SCBA)
above 10 ppm or unknown - SCBA
EYE/FACE: safety glasses or goggles
SKIN: no special care needed
DECOMPOSITION: not significant



Muriatic Acid (Hydrochloric Acid) liquid – pool cleaning chemical

VENTILATION: none generally needed
RESPIRATORY: NIOSH-approved respirator – acid gas cartridge
EYE/FACE: safety glasses or goggles; eyewash station required
SKIN: gloves, boots, aprons, or chemical suit as necessary
DECOMPOSITION: highly reactive if water is added to it; releases H₂ highly flammable gas upon contact with most metals



Calcium hypochlorite and bromine compounds require use of a respirator - either a half face APR (air purifying respirator) with goggles or a full face APR will work just fine – the latter does not require the wearer to be clean-shaven, but is significantly more expensive. Chlorine gas requires a respirator for concentrations up to 5 ppm, SAR (supplied air respirator), PAPR (powered air-purifying respirator), or SCBA (self contained breathing apparatus) for up to 10 ppm, and SCBA for above 10 ppm, emergency, or unknown-atmosphere conditions.

Half face disposable APR (single use)

3M Maintenance Free Organic Vapor/Acid Gas Respirator,
NIOSH Approval TC-23C-865,
5000 Series – list price under \$24 – usually available for under \$20



Half face reusable APR (multiple use)

3M Half Face Respirator 6000 Series, Reusable	(all prices list)
6200 half face respirator	18.00 each
6003 organic vapor/acid dust cartridge	12.00 pair
	51411 filter retainer
	2.00
501 particulate pre-filter	1.50



Full face reusable APR (multiple use)

3M Full Face Respirator 6000 Series, Reusable	(all prices list)
6800 full face respirator	140.00 each
6003 organic vapor/acid dust cartridge	12.00 pair
	51411 filter retainer
	2.00
501 particulate pre-filter	1.50



PAPR



SCBA



SAR



NFPA SYMBOL EXPLAINED: The four divisions are typically color-coded, with **health hazard indicated by blue, flammability indicated by red, reactivity (chemical instability) indicated by yellow, and special or unique hazards indicated by white.** Each section is rated on a scale from 0 (no hazard) to 4 (severe risk).



Health (Blue)		Flammability (Red)	
4	Very short exposure could cause death or major residual injury (e.g., hydrogen cyanide, phosphine)	4	Will rapidly or completely vaporize at normal atmospheric pressure and temperature, or is readily dispersed in air and will burn readily (e.g., propane). Flash point below 23°C (73°F)
3	Short exposure could cause serious temporary or moderate residual injury (e.g., chlorine gas)	3	Liquids and solids that can be ignited under almost all ambient temperature conditions (e.g., gasoline). Flash point between 23°C (73°F) and 38°C (100°F)
2	Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury (e.g., ethyl ether)	2	Must be moderately heated or exposed to relatively high ambient temperature before ignition can occur (e.g., diesel fuel). Flash point between 38°C (100°F) and 93°C (200°F)
1	Exposure would cause irritation with only minor residual injury (e.g., acetone)	1	Must be heated before ignition can occur (e.g., soybean oil). Flash point over 93°C (200°F)
0	Poses no health hazard, no precautions necessary. (e.g., lanolin)	0	Will not burn (e.g., water)
Instability/Reactivity (Yellow)		Special (White)	
4	Readily capable of detonation or explosive decomposition at normal temperatures and pressures (e.g., nitroglycerine, RDX)		The white "special notice" area can contain several symbols. The following symbols are defined by the NFPA 704 standard:
3	Capable of detonation or explosive decomposition but requires a strong initiating source, must be heated under confinement before initiation, reacts explosively with water, or will detonate if severely shocked (e.g. ammonium nitrate)	W	Reacts with Water in an unusual or dangerous manner (e.g., caesium, sodium)
2	Undergoes violent chemical change at elevated temperatures and pressures, reacts violently with water, or may form explosive mixtures with water (e.g., phosphorus, potassium, sodium)	OXY	Oxidizer (e.g., potassium perchlorate, ammonium nitrate, hydrogen peroxide)
1	Normally stable, but can become unstable at elevated temperatures and pressures (e.g. propene)	SA	Simple asphyxiant gas (includes nitrogen, helium, neon, argon, krypton, and xenon)
0	Normally stable, even under fire exposure conditions, and is not reactive with water (e.g. helium)		

Non-Standard Symbols

Note: These symbols are not part of the NFPA 704 standard, but occasionally used in an unofficial manner in the white section. The use of non-standard symbols or text may be permitted, required or disallowed by the authority having jurisdiction (e.g., fire department).

- **COR** Corrosive; strong acid or base (e.g. sulfuric acid, potassium hydroxide)
- **ACID** Acid
- **ALK** Alkali
- **BIO** Biological hazard (e.g., smallpox virus)
- **POI** Poisonous (e.g. Strychnine)
- **CYL** Cryogenic (e.g. Liquid Nitrogen)
- **CRYO** Cryogenic (e.g. Liquid Nitrogen)