

# BROMINE - SPILL RESPONSE PROCEDURES

Bromine (Br<sub>2</sub>) can cause extreme irritation to the nose, throat and respiratory system at low level vapor exposure. Severe exposures to vapors or contact with Br<sub>2</sub> solutions can cause nose and throat burns, lung inflammation and pulmonary edema.

Due to the extreme toxicity and corrosivity of Br<sub>2</sub> any spill of this material must be cleaned up with great care.

## EXPOSURE GUIDE LINES

### ACGIH

TLV	0.1 ppm	0.66 mg/m <sup>3</sup>
STEL	0.2 ppm	1.3 mg/m <sup>3</sup>

### OSHA

PEL	0.1 ppm	0.7 mg/m <sup>3</sup>
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### NIOSH

REL	0.1 ppm	0.7 mg/m <sup>3</sup>
STEL	0.3 ppm	2 mg/m <sup>3</sup>

All spills of Bromine will be cleaned by the emergency response team. The immediate area of the Br<sub>2</sub> spill must be cleared of all non-response personnel. Depending on the concentration of the Br<sub>2</sub> solution and location of the spill, an **EVACUATION** must be considered.

### Personal Protective Equipment

Minimum PPE for Bromine response includes:

FULL NEOPRENE BOOTS  
KAPPLER Zytron 500 SUITS, LEVEL B w/ HOOD UP  
NEOPRENE GLOVES over SOLVEX GLOVES over N-DEX  
UNDERLINERS  
SCBA  
HARD HAT WITH FACE SHIELD

### Response Procedures

#### A. Polypropylene Pad Method

The Bromine will be absorbed on polypropylene pads, which will be placed in an appropriate container (5 gal plastic pals or lined drums), secured and then transported to the waste water treatment facility or the hazardous waste yard for treatment or disposal.

The remaining bromine residue will be neutralized using a 10 - 25% SODIUM THIOSULFATE solution. The neutralized residue will be absorbed on pads and placed in appropriate containers. This material will be treated as a hazardous waste until determined otherwise.

This neutralization treatment will be done at least three times. Additional treatment will continue until all residue is neutralized.

Final clean-up will be performed using normal and appropriate maintenance procedures for the contaminated area.

#### B. Bulk Sorbent Method

Free liquid will be diked and contained with a sorbent such as MAGIC SORB<sup>(tm)</sup>. Sufficient material will be spread over the spill to just cover the surface with a light coating and to reduce the amount of Bromine vapor being released to the atmosphere. The solid will be thoroughly mixed to effect absorption of all free liquid. All spill residue will be placed in an appropriate container (5 gal plastic pals or lined drums), secured and then transported to the waste water treatment facility or the hazardous waste yard for treatment or disposal.

After all free liquid is absorbed and the residue is containerized, the area should be rinsed at least three times with a 10 - 25% SODIUM THIOSULFATE solution. Excess sodium thiosulfate should be removed from the area using the bulk sorbent and to remove residual contamination and excess solid neutralizer.

All spill residue will be treated as a hazardous waste. Final clean-up will be performed using normal and appropriate maintenance procedures for the contaminated area.