SPILL KIT TREATMENT GUIDE

ANSUL® Spill Control Products

TYCO FIRE SUPPRESSION & BUILDING PRODUCTS, MARINETTE, WI 54143-2542
Part No. 78908-04

BLANK

BE PREPARED ...

Please familiarize yourself with the contents and applications of this kit prior to use. This will help ensure safer, more effective response in the event of a chemical spill.

INSTRUCTIONS

Chemical spills present a variety of hazards in the workplace. For example, corrosives such as acids and caustics can cause severe burns on contact to skin and eyes, and the presence of fumes can be damaging to the respiratory system. Also, many organic solvents are flammable and release vapors which are irritating to the eyes and respiratory system. Taking personal protective measures is always the first step in responding to chemical spills.

1

SAFETY FIRST
– isolate spill area
– notify proper authorities
– wear adequate protection


000795

eye


000796

hand


000797

respiratory

Personal protective clothing suitable for the hazard should be worn to prevent direct contact with the spilled substance and its vapors. The eye and hand protection provided with this kit along with your lab clothing offers minimum protection needed for spill clean-up.

2

IDENTIFY SPILL
– acid?
– caustic?
– solvent?
– formaldehyde?
– other?

Knowledge of a particular chemical's hazardous characteristics can be obtained from its labeling, Material Safety Data Sheet (MSDS), the manufacturer, and supervisory personnel. Review the substance's MSDS to see if additional bodily or respiratory protective measures may be required and what first aid steps should be taken in case of spill contact.

3

SELECT AGENT

for acid spills... **for caustic spills...** **for solvent spills...**

Spill-X-A® ACID NEUTRALIZER

Spill-X-C® CAUSTIC NEUTRALIZER

Spill-X-S® SOLVENT ADSORBENT

for formaldehyde spills…

Spill-X-FP® FORMALDEHYDE POLYMERIZER

Your SPILL TREATMENT KIT contains spill control agents specially formulated to treat particular classes and sizes of chemical spills. Kits are available packaged with either SPILL-X-A agent, SPILL-X-C agent, SPILL-X-S agent, SPILL-X-FP agent or in certain combinations (see back page of Guide for combinations available). Using this Guide, evaluate agent suitability for spill size and type. **Do not use any agent on substances other than those listed for that agent in the Chemical Spill Treatment Ratio Table** (next page). Upon deciding to proceed with spill clean-up, be sure to wear all required personal protective equipment.

Spill Shakers

4

TREAT SPILL

encircle, cover with agent

mix agent into spill

⚠ CAUTION

Remove sources of ignition if spilled material is flammable.

Discard safety seal from inside agent bottle cap. Begin spill treatment by pouring agent around spill to encircle and dike its perimeter. Taking care to avoid splashing, continue to apply agent evenly onto spill. Using scraper provided, carefully mix agent into spill for the most complete reaction. If spill was corrosive, any neutralization reaction will subside after a few minutes leaving a paste-like residue. If spill was a formaldehyde solution, complete solidification may not occur. For dilute solutions, see Formaldehyde Treatment Ratio Table for solidification information. If spill was a solvent, agent adsorption is indicated by the disappearance of free liquid.

5
RESTORE AREA

000800

disposition and clean-up

000801

label, proper disposal

SPILL-X-A and SPILL-X-C agents work as acid/base neutralizers respectively. Test representative samples of spill residue for final pH (see Page 5). Add more agent if necessary. SPILL-X-S agent adheres (**ad**sorbs) solvent onto a carbonaceous matrix. Final spill residue should be dry and powdery. SPILL-X-FP agent polymerizes formaldehyde, but **may not** solidify waste. Use SPILL-X-S agent to solidify any remaining liquid. Record spill type, treatment (e.g., "neutralized acid/base, pH =____", "adsorbed solvent: name") and disposition (i.e., recommended disposal method) onto label of bag(s) provided. After treatment reaction cools, use scraper and pan to pick up residue and place into labeled bag. Rinse and decontaminate utensils, area. Residue disposal must follow your company guidelines and meet local, state and federal regulations.

HOW TO USE THIS TABLE ...

The type and size of the chemical spill determines the choice and amount of SPILL-X agent to use. The following is a list of chemicals which have been tested with the appropriate SPILL-X agent. Additional chemicals are being tested. If you have a chemical which does not appear on the list, call ANSUL at 1-800-346-3626 to see if testing has been performed.

CHEMICAL SPILL TREATMENT RATIOS

After identifying the chemical spilled, find its name (and concentration if applicable) on a list below. **If it is not on a list, do not use this kit on the spill.** Each list gives the amount of spilled chemical that can be treated with the contents of one SPILL-X agent container. Use multiple containers for larger spills.

ACID SPILLS

If an acid spill of the type below, one 2.5 lb (1.13 kg) SPILL-X-A agent container will treat the following amount of spilled acid:

TABLE 1 – SPILL-X-A AGENT APPLICATION

Type of Acid	% Concentration		Neutralization and Solidification SC-30-A Applicator* gal	(L)	Amount Neutralized/ Solidified Pints	(L)	Treated Material Form After 15-30 Minutes of Cooling
Acetic	99%	(17.4 Molarity)	2.50	(9.5)	2.40	(1.14)	Solid
Adipic	10%	(0.68 Molarity)	2.50	(9.5)	1.96	(0.93)	Solid
Acrylic	99%	(14.4 Molarity)	2.50	(9.5)	1.96	(0.93)	Solid
Butyric	99%	(10.8 Molarity)	2.50	(9.5)	1.96	(0.93)	Solid
Chlorosulfonic	99%	(14.9 Molarity)	2.50	(9.5)	1.57	(0.74)	Solid
Cyanoacetic	50%	(5.9 Molarity)	2.50	(9.5)	1.96	(0.93)	Solid
Formic	90%	(23.3 Molarity)	2.50	(9.5)	1.96	(0.93)	Solid
Hydriodic	50%	(6.0 Molarity)	2.50	(9.5)	1.96	(0.93)	Solid
Hydrochloric (Muriatic)	37%	(12.0 Molarity)	2.50	(9.5)	2.12	(1.0)	Paste
Hydrofluoric	49%	(28.4 Molarity)	2.50	(9.5)	1.96	(0.93)	Solid
Methacrylic	98%	(11.6 Molarity)	2.50	(9.5)	1.96	(0.93)	Solid
Nitric	70%	(15.9 Molarity)	2.50	(9.5)	4.42	(2.08)	Solid
Propionic	99%	(13.3 Molarity)	2.50	(9.5)	1.96	(0.93)	Solid
Perchloric	70%	(11.7 Molarity)	2.50	(9.5)	2.35	(1.11)	Solid
Phosphoric	85%	(12.0 Molarity)	2.50	(9.5)	2.42	(1.14)	Solid
Sulfuric	93%	(17.4 Molarity)	2.50	(9.5)	2.28	(1.08)	Solid

*The SC-30-A hand portable applicator contains 30 lb (13.6 kg) of SPILL-X-A agent. The 5 gal pail holds 50 lb (22.7 k) of SPILL-X-A agent. The fibredrum holds 200 lb (90.7 kg) of SPILL-X-A agent.

CAUSTIC SPILLS

If a caustic spill of the type below, one 2.0 lb (0.90 kg) SPILL-X-C agent container will treat the following amount of spilled caustic:

Types of Caustic	% Concentration	Amount Neutralized/Solidified Pints	(liters)
Ammonium Hydroxide	29%	2.80	(1.32)
Aniline		0.61	(0.29)
Diethanolamine		0.71	(0.34)
Diethylamine		0.75	(0.35)
Diethylenetriamine		0.75	(0.35)
Dimethylformamide		0.53	(0.25)
Ethylenediamine		0.70	(0.33)
Hydrazine	64%	1.15	(0.54)
Morpholine		0.75	(0.35)
Potassium Hydroxide	45%	1.84	(0.87)
Pyridine		0.72	(0.34)
Sodium Hydroxide	50%	1.15	(0.54)

FORMALDEHYDE SPILLS

If a formaldehyde spill of the concentration below, one 1.85 lb (0.84 kg) SPILL-X-FP agent container will treat the following amount of spilled formaldehyde:

Formaldehyde (AKA Formalin) Concentration (WT%)	Amount Polymerized Pints	(liters)
37	1.54	0.73
30	1.92	0.91
20	2.96	1.40
15	3.99	1.89
10	6.11	2.89
4 (10% V/V)	15.49	7.33
Glutaralhyde (25%)	2.52	1.19

Actual amount polymerized and solidified may vary according to application. For solution strengths of less than 15 wt. %, it may be necessary to solidify any remaining liquid with SPILL-X-S agent.

SOLVENT SPILLS

If a solvent spill of the type below, one 1.0 lb (0.45 kg) SPILL-X-S agent container will treat the following amount of spilled solvent:

Solvent	Amount Adsorbed Pints	(liters)
Flammable:		
Acetone	1.60	0.76
Acetonitrile*	—	—
Acrylonitrile	1.20	0.57
Avgas 100	1.20	0.57
Benzene	1.06	0.50
Butylacetate	1.04	0.49
Butylether	0.96	0.45
Butyraldehyde	1.04	0.49
Carbon Disulfide	0.88	0.42
Cumene	1.04	0.49
Cyclohexane	0.96	0.45
Decane	1.04	0.49
1,2-Dichloroethane	0.72	0.34
Diethylamine	1.20	0.57
1-Diethylamino-2-Propanol	1.20	0.57
N,N-Diethyethanolamine	0.80	0.39
Dimethylformamide	0.64	0.30
Ethanol	0.96	0.45
Ethylenediamine	0.96	0.45
Ethylene-Glycoldimethylether	1.04	0.49
Formamide*	—	—
Fuel Oil #2	0.96	0.45
Gasoline (50-100 Octane)	0.96	0.45
Gasoline (100-130 Octane)	1.36	0.64
Gasoline, Unleaded	1.36	0.64
Heptane	1.28	0.61
Hexane	0.96	0.45
Isopropylalcohol	1.44	0.68
Isopropylamine	1.20	0.57
Jet A-1 Avtur	0.88	0.42
Methanol	0.96	0.45
Methyl Ethyl Ketone	1.60	0.76
Methylisobutylketone	1.52	0.72
Morpholine	0.96	0.45
Nonane	1.04	0.49
Octane	0.80	0.39
Pentane	0.88	0.42
Petroleum Ether	1.60	0.76
1 – Propanol*	—	—
2 – Propanol*	—	—
Pyridine	1.60	0.76
Styrene	1.04	0.49
Tetrahydroforan*	—	—
Toluene	0.96	0.45
Triethylamine	0.96	0.45
Vinyl Acetate	1.44	0.68
Xylene, O-	1.20	0.57
Xylene, P-	0.96	0.45

*Contact ANSUL Technical Services.

SOLVENT SPILLS (Continued)

Solvent	Amount Adsorbed Pints	(liters)
Nonflammable:		
1-Amino-2-Propanol	0.96	0.45
Aniline	0.88	0.42
2-Butoxyethanol	0.80	0.39
Carbon Tetrachloride	0.88	0.42
Chloroform	1.04	0.49
Diethanolamine	1.20	0.57
Diethyleneglycol Dimethylether	0.88	0.42
Diethylene Triamine	1.20	0.57
Ethanolamine	0.88	0.42
5-Ethyl-2-Methylpyridine	0.88	0.42
Toluene Diisocyanate	0.88	0.42
1,1,1-Trichloroethane	0.64	0.30
1,1,2-Trichloroethane	1.92	0.91
Triethylene Tetramine	1.20	0.57

DISPOSITION OF TREATED SPILL RESIDUE ...

A spilled chemical may be 'hazardous' because it contains an RCRA listed waste or because it possesses one or more 'hazardous characteristics' as defined by the U.S. Environmental Protection Agency. SPILL-X-A and SPILL-X-C agents are formulated to treat only the hazardous characteristic of corrosivity. SPILL-X-S agent, because it **ad**sorbs solvents and their vapors, can help reduce vapor evolution and therefore flammability. SPILL-X-FP agent chemically reacts with formaldehyde to yield the polymer polynoxylin. SPILL-X-FP agent reduces the formaldehyde vapors because the chemical bonds formed do not allow the release of reacted formaldehyde. Chemical spills treated with the appropriate SPILL-X agent may still possess additional properties which are 'hazardous' as characterized by the EPA. For example, chromic acid spills can cause chemical burns on contact to skin and eyes because of their corrosive characteristic. Using SPILL-X-A agent, it is possible to eliminate this corrosivity characteristic. However, since in this case the spill residue contains chromate salts (an RCRA listed waste) the residue must still be disposed of as a hazardous waste. Final disposition of all spill waste residue must be in consideration of the presence of any remaining hazardous characteristic.

SPILL-X-A and SPILL-X-C agents are acid/base neutralizers respectively; formulated to address the hazardous characteristic of 'corrosivity.' Neutralization reaction efficiency can be measured using conventional pH measuring procedures.

MEASURING pH

Personal protective equipment must be worn during this procedure.

1. Place about 10 cc of a representative sample of spill residue in a 150 ml beaker.
2. Slowly add distilled water until mixture volume reaches 100 ml. Stir contents for about 3 minutes **(Note:** severe foaming and high heat generation is a sign of incomplete spill neutralization).
3. Using a pH meter or pH test strips (provided), test solution pH. The U.S. EPA criteria for solid, noncorrosive acid or caustic waste requires a pH from 2.0 to 12.5. If the pH is unacceptable, mix more of the appropriate SPILL-X agent into spill and retest for pH. Repeat this procedure as necessary until spill residue pH is acceptable.
4. Record final pH onto Chemical Spill Waste disposal bag (provided) along with other pertinent information. Indicate on the bag what the final disposition of the waste should be. Dispose of following company, local, state and federal guidelines.

ADSORPTION

SPILL-X-S agent is a proprietary carbonaceous substrate designed to adsorb spills of many common solvents. Adsorption does not chemically alter the substance being adsorbed. However, some physical properties (e.g., flashpoint) can be modified by the adsorptive process. Proper adsorption condenses the solvent and its vapors onto the SPILL-X-S agent substrate allowing spill residue to be simply swept-up, minimizing the amount of spill waste residue for transport to final disposal or incineration site. Furthermore, adsorption can help limit solvent vaporization, reducing workplace contamination and flammability hazards.

POLYMERIZATION REACTIONS

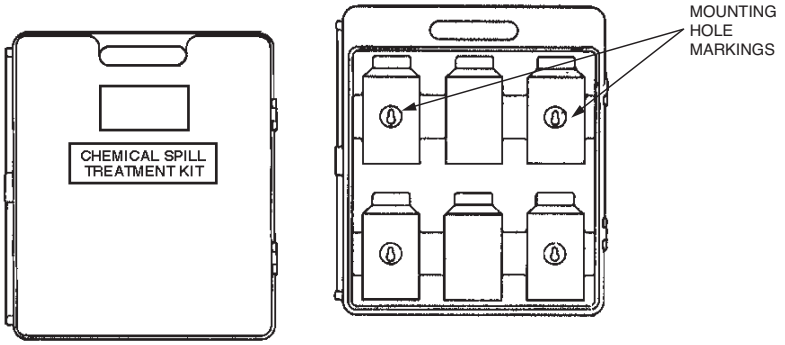
SPILL-X-FP agent is a urea-based agent designed to chemically react with formaldehyde solutions. The end product of a treated formaldehyde spill is the polymer polynoxylin. The reaction rate is affected by the spill temperature and the formaldehyde concentration.

PLACING YOUR SPILL TREATMENT KIT…

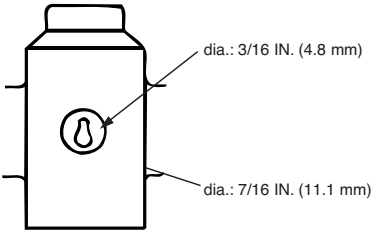
SPILL TREATMENT KITS are designed to allow faster, safer, better spill response. Portable and rugged, kits should be placed on all spill response carts and vehicles in areas where hazardous chemicals are handled. Kits can also be wall mounted using the wall mount screws and anchors provided. This assures high visibility and readiness in laboratories, storerooms, and hallways. Faster, safer, better spill response using SPILL TREATMENT KITS can lessen employee chemical exposure, facility downtime, and the amount of hazardous spill waste residue for disposal.

WALL MOUNT INSTRUCTIONS

Examine the SPILL TREATMENT KIT to become familiar with its contents. Find and set aside the bag containing the two mounting screws and anchors. Remove the six containers of SPILL-X agent. Note the mounting hole markings at the back of the four outer bottle slots. **Use only these sites for wall mounting purposes.**



The mounting hole markings can be drilled out to allow either permanent wall mounting or to create 'keyhole slots' for Kit removability. Under normal conditions only the top two markings need be used. Drill a 3/16 in. (4.8 mm) hole in the top of each marking for permanent wall mounting. To create 'keyhole slots,' drill additional 7/16 in. (11.1 mm) holes as indicated below and cut out the material between the small and large holes.



Determine the best site and height for Kit mounting. Visibility, accessibility, proximity to exits, and wall construction must all be considered. Hold the drilled-out Kit level at the desired mounting site and mark the wall for mounting screw placement. Use the plastic anchors for mounting on plasterboard. Anchors require a 3/8 in. (9.5 mm) hole for insertion. Insert the screws into the 3/16 in. (4.8 mm) mounting holes drilled in the Kit, then drive the screws through the holes and into the wall until tight. If 'keyhole slots' are used, back screws off slightly to allow case removability.

MSDS INFORMATION

MSDS AVAILABLE AT: www.ansul.com

CAUTION: STAY PREPARED…

Don't get caught with an empty Kit. Reorder SPILL-X agents and accessories as soon as you've finished spill response.

REORDER INFORMATION

Listed below are descriptions and part numbers for SPILL RESPONSE KITS and accessories. Include this information on all orders. Thank you!

Description	Contents	Part No.
Chemical Spill Treatment Kit	2 Containers each: SPILL-X-A Agent, SPILL-X-C Agent, SPILL-X-S Agent, Plus Accessories	78774
Acid Spill Treatment Kit	6 Containers each: SPILL-X-A Agent, Plus Accessories	78776
Caustic Spill Treatment Kit	6 Containers each: SPILL-X-C Agent, Plus Accessories	78777
Solvent Spill Treatment Kit	6 Containers each: SPILL-X-S Agent, Plus Accessories	78778
Formaldehyde/Solvent Spill Treatment Kit	3 Containers each: SPILL-X-FP Agent, SPILL-X-S Agent, Plus Accessories	73834
Chemical Spill Treatment Agent	2 Containers each: SPILL-X-A Agent, SPILL-X-C Agent, SPILL-X-S Agent	77358
Acid Spill Treatment Agent	6 Containers each SPILL-X-A Agent	77255
Caustic Spill Treatment Agent	6 Containers each SPILL-X-C Agent	77261
Solvent Spill Treatment Agent	6 Containers each SPILL-X-S Agent	77265
Formaldehyde Spill Treatment Agent	6 Containers each: SPILL-X-FP Agent	78435
Spill Treatment Kit Accessories	1 Pair Safety Gloves, 1 Pair Safety Goggles, 2 Clean-Up Pans, 1 Mixer-Scraper, 6 Chemical Spill Waste Bags, 1 Spill Kit Treatment Guide	78919