Technical Information on Cleaning Products for Fentanyl and Methamphetamine

The tables below include information on products and ingredients that have been tested for their effectiveness at removing or breaking down environmental methamphetamine or fentanyl. This information is not an endorsement by the Washington State Department of Health, and the products are not listed by effectiveness or recommendation. The information below may help you choose a cleaning product that is appropriate to your facility or situation.

This symbol indicates that the cleaner contains ingredients that are hazardous to the eyes. The cleaner may require an eyewash station and chemical splash goggles to use. Review the product Safety Data Sheet for more information and to see if an eyewash is required. Additional information on emergency eyewash requirements can be found at DOSH Directive (WRD) 13.00 Emergency Washing Facilities. L&I also has resources on Eyewash and Emergency Washing Facilities; you can contact them using eyeonsafety@lni.wa.gov.

Table 1. Effectiveness of Water and General Cleaners on Fentanyl and Methamphetamine

Product Name	Cleaning Agent	Effectiveness Against Fentanyl	Effectiveness Against Methamphetamine
Water	H_2O	62-95% removal, 33-80% fentanyl in runoff with 1-hour contact time (Oudejans, 2022). "No degradation" (Oudejans, 2023).	About 69% removed after hosing down HDPE surface (nonporous) with water (comparing median concentrations post-cook and post-decontamination). It was noted that less meth was removed using water if organic solvent was also present on surface. The use of water in this case left a thin film of meth on the surface (Ciesielski et al. 2020). Hot water is not more effective than cold water for cleaning (EPA, 2021). Scrubbing with water was more effective on removing fentanyl compared to scrubbing with no water (Froelich et al., 2018).

Formula 409	0.3% of alkyl dimethyl benzyl ammonium chloride	No studies found.	Removal of 90% after 1 wash, 95% after 3 washes on latex-painted drywall (Serrano et al. 2012; Martyny, 2014).
Crystal Simple Green	C9-11 Alcohols Ethoxylated, surfactant, Tetrasodium Glutamate Diacetate	No studies found.	No degradation seen (Singh, 2004).
Simple Green All Purpose Cleaner by Sunshine Makers Inc	2-butoxyethanol, ethoxylated alcohol, tetrapotassium pyrophosphate, sodium citrate	No studies found.	100% removal after 1 wash on glass or sheet metal. 53% removed after 1 wash, 63% after 2 washes, 80% after 3 washes on painted plywood. 77% removed after 1 and 2 washes, 81% after 3 washes on latex-painted drywall, using wipe sample after wipe cleaning step (Serrano et al. 2012; Martyny, 2008).
Pine Sol	Alkyl alcohol alkoxylate, Glycolic acid	No studies found.	No degradation seen (Singh, 2004).
Liqui-Nox	Sodium Alkylbenzene Sulfonate	No studies found.	No degradation seen (Singh, 2004).
TSP Detergent	Trisodium phosphate	No studies found.	No degradation seen (Singh, 2004).

Table 2. Effectiveness of Hydrogen Peroxide Cleaners on Fentanyl and Methamphetamine

Product Name	Cleaning Agent	Effectiveness Against Fentanyl	Effectiveness Against Methamphetamine
Hydrogen peroxide	10% H_2O_2 (Lindén et al. 2024)	Low degradation: 48% of fentanyl remained after 19 hours in hydrogen peroxide. 23% of carfentanil remained after 18 hours. Low results regardless of stirring or not. (Lindén et al. 2024).	No studies found.
	H_2O_2 pH 5 (Qi et al. 2011)	10.4% degraded (after 5 minutes), 14.5% (10 minutes), 34.6% (30 minutes), 53% (60 minutes) stirring in a flask (Qi et al. 2011).	

Alkalized hydrogen peroxide	Added sodium carbonate to 15% hydrogen peroxide to reach pH 8.5	No studies found.	82%-93% degraded (wipe sample on drywall, vinyl floor tiles, galvanized metal, and glass; Owens, 2017).
Meth Remover by Apple Environmental	Two-part: 1. quats, isopropanol, dimethyltallow alkyl amines 2. 4% hydrogen peroxide	37-78% removal, 14-32% fentanyl in runoff with 1 hour contact time (Oudejans, 2022) 23-58% degradation (Oudejans, 2021). 'Minimal degradation" (Oudejans, 2023)	No studies found.
ZEP Professional Stain Remover with Peroxide	Hydrogen peroxide, 4%	57-78% removal, 11-55% fentanyl in runoff with 1-hour contact time (Oudejans, 2022). 14-46% degradation (Oudejans, 2021). "Minimal degradation" (Oudejans, 2023).	No studies found.
OxiClean	Percarbonate, hydrogen peroxide	50-78% removal, 32-66% fentanyl in runoff (1-hour contact time; Oudejans, 2022). "Poor degradation" (Oudejans, 2023) Fentanyl and acetylfentanyl removed after scrubbing with OxiClean applied for 0 minutes or 15 minutes. Fentanyl and acetylfentanyl were not removed after 30-minute OxiClean application because it dried on the surface, so scrubbing without liquid had no effect (Froelich et al., 2018).	No studies found

Bio-Oxygen Chem Decon	Two-part: 1. Potassium carbonate, 2-propanol, N-alkyl (C12-18)-N,N-dimethyl-N-benzalkonium chlorides other quats; 2. Hydrogen peroxide	No studies found	Oxidatively degrades meth and precursor ephedrine effectively. 71 ± 3% meth degraded over 1 hour 95 ± 3% meth degraded over 4 hours (Mayer et al., 2023)

Sisco et al. 2019 was reviewed and determined to have inadequate study methods.

Table 3. Effectiveness of Peracetic Acid Cleaners on Fentanyl and Methamphetamine

Product Name	Cleaning Agent	Effectiveness Against Fentanyl	Effectiveness Against Methamphetamine
Dahlgren Decon	Three-part: 1. polyoxyethylated tridecyl alcohol <3% 2. sodium hydroxide ≥85% 3. Boron oxide <40%, acetic acid <30%, peroxyacetic acid <30% Creates peracetic acid, 1.7%	86-99.5% removal, 0.0022-0.024% fentanyl in runoff with 1-hour contact time (Oudejans, 2022) Reapplication does not significantly improve degradation efficacy (Oudejans, 2021) 89-98% degradation using diluted 1:4 with 5-minute application time (Oudejans, 2021) "Best degradation" (Oudejans, 2023) High degradation: No fentanyl and carfentanil detected after 10 minutes (Lindén et al., 2024)	No studies found.
EasyDecon DF200	3-part solution: 1. quaternary ammonium compounds <6.5% 2. hydrogen peroxide <8% 3. diacetin <60%	93-99.3% removal, 0.083-9.1% fentanyl in runoff with 1-hour contact time (Oudejans, 2022) "Best degradation" (Oudejans, 2023)	100% degraded after 1 wash, 100% after 3 washes (wipe sample on drywall; Martyny, 2014) 100% degraded after 1 wash on latex-painted drywall (Wipe sample; Serrano et al. 2012)
Peracetic acid	CH_3CO_3H, pH 8	90.7% degraded (after 5 minutes), 92.1% (10 minutes), 93% (30 minutes), 95.1% (60 minutes)	No studies found.

Table 4. Effectiveness of Products Marketed to Law Enforcement on Fentanyl and Methamphetamine

Product Name	Cleaning Agent	Effectiveness Against Fentanyl	Effectiveness Against Meth-amphetamine
FAST-ACT	Dry. Mixed aggregates of magnesium oxide (MgO) and titanium dioxide (TiO_2) nanoparticles	Medium/high degradation: "less than 5% of the compounds remained after 10 minutes," but this was assumed to be from adsorption of fentanyl and carfentanil onto FAST-ACT rather than degradation. (Lindén et al., 2024)	No studies found.
GDS2000	Alkaline solution	No degradation (for both fentanyl and carfentanil).	No studies found.
Reactive Skin Decontamination Lotion (RSDL)	Alkaline solution Potassium 2,3-butanedione mono-oxime (DAM) and diacetyl mono-oximate (Dekon-139) in polyethylene glycol monomethyl ether and water	No degradation (for both fentanyl and carfentanil). (Lindén et al., 2024)	No studies found.

Table 5. Effectiveness of Non-Chemical Agents on Fentanyl and Methamphetamine

Product Name	Cleaning Agent	Effectiveness Against Fentanyl	Effectiveness Against Methamphetamine
Ozone	335 ppm O_3	No studies found.	97% degradation in 12 minutes, no wiping (Rindelaub & Miskelly, 2019).
UV light	Ultraviolet light	3% of original fentanyl concentration remained after 4 days of UV irradiation of 254 nm in the lab, which is equivalent to about exposure to sunlight for 10, 10-hour days. (Reitstetter, 2018)	No studies found.
Temperature	42 degrees Celsius	28% of original fentanyl concentration remained after 4 days of exposure to 42 degrees C in the lab. (Reitstetter, 2018)	No studies found.

Do not mix bleach products with other cleaners, ammonia, or acids, because this can create toxic gases that cause life threatening injuries. Visit Dangers of Mixing Bleach with Cleaners (http://doh.wa.gov/community-and-environment/contaminants/bleach-mixing-danger) for more information. The acidified bleach products in the table below are mixed by trained professionals; **the research is included for informational purposes only and product mixing should not be attempted.**

Table 6. Effectiveness of Bleach Products on Fentanyl and Methamphetamine

Product Name	Cleaning Agent	Effectiveness Against Fentanyl	Effectiveness Against Methamphetamine
Full strength bleach (pH 12)	Ultra Clorox Germicidal Bleach, 6.15% sodium hypochlorite (Singh, 2004) K-O-K bleach, 5.5% (Oudejans, 2022) Klorin (Colgate-Palmolive) <5% sodium hypochlorite (Lindén et al., 2024)	69% removal with "pH12 undiluted bleach," 1-hour contact time (Oudejans, 2022). "Good degradation" as "full strength bleach" (Oudejans, 2023). Medium degradation: "less than 50% of fentanyl and carfentanil detected after one hour and/or full degradation observed within 24 hours" (Lindén et al., 2024).	90% degradation (Singh, 2004).
Clorox Clean-Up	1.84% sodium hypochlorite	No studies found.	57% removed after 1 wash, 64% after 3 washes on latex-painted drywall (Serrano et al. 2012; Martyny, 2014).
Trichloroisocyanuric acid	$C_3O_3N_3Cl_3$, pH 5	96.5% degradation (after 2 minutes), 98.6% (5 minutes), 99% (10 minutes), 99.5% (30 minutes), >99.9% (60 minutes).	No studies found.

Calcium hypochlorite	$Ca(ClO)_2$, pH 12 (Qi et al., 2011) $Ca(ClO)_2$, 0.2 M (Lindén, et al., 2024)	85.9% degraded (after 2 minutes), 59.2% (5 minutes), 41.7% (10 minutes), 38.9% (30 minutes), 36.9% (60 minutes) (Qi et al., 2011). Medium degradation: "less than 50% of fentanyl and carfentanil detected after one hour and/or full degradation observed within 24 hours" (Lindén et al., 2024).	No studies found.
Bleach plus additives	Bleach plus TWEEN 20, ethanol (50%), tetrahydrofuran	TWEEN 20, ethanol, and tetrahydrofuran added to bleach did not decrease fentanyl clumping, and ethanol further decreased degradation ability of bleach. (Lindén et al., 2024)	No studies found.
Domestos Spray Bleach	0.52% sodium hypochlorite	Fentanyl agglomerated, leading to poor recovery via wipe. Unable to assess degradation accurately. (Lindén et al., 2024)	No studies found.
Effekt Klor	0.95% sodium hypochlorite pH 9.5	Fentanyl agglomerated, leading to poor recovery via wipe. Unable to assess degradation accurately. Dried rapidly, reducing effectiveness. No difference in degradation effectiveness compared to water. (Lindén et al., 2024)	No studies found.
Alldecont MED	Hypochlorite	Medium degradation: "less than 50% of fentanyl and carfentanil detected after one hour and/or full degradation observed within 24 hours. 1% fentanyl remained in alldecont MED after 26 hours." (Lindén et al., 2024)	No studies found.

Acidified bleach (pH 7)	K-O-K bleach: hypochlorite 0.6%, hypochlorous acid, acidified to pH 7	59-91% removal, 1.7-25% fentanyl in runoff with 1-hour contact time (Oudejans et al., 2021; Oudejans, 2022) "Good degradation" (Oudejans, 2023).	No studies found.
Acidified bleach (pH 5)	K-O-K bleach: hypochlorite 0.5%, hypochlorous acid, acidified to pH 5 (Oudejans et al., 2021) Unspecified bleach product and strength, acidified to pH 5 (Lindén et al., 2024)	94-98% removal, 1.5-4.7% fentanyl in runoff with 1-hour contact time (Oudejans et al., 2021; Oudejans, 2022). "Best degradation" (Oudejans, 2023). High degradation: no fentanyl and carfentanil detected after 10 minutes (Lindén et al., 2024).	No studies found.
Acidified Clorox® Pro Results Garage & Driveway Cleaner	Sodium hypochlorite <5%, sodium hydroxide <1%. myristamine oxide, acidified to pH 5, strength reduced to 0.5% sodium hypochlorite (Oudejans, 2021)	94-99% removed, 0.8-2.2% fentanyl in runoff with 1-hour contact time (Oudejans et al., 2021; Oudejans, 2022). Reapplication does not significantly improve degradation efficacy (Oudejans, 2021). 55-66% degradation with 5-minute application time (Oudejans, 2021).	No studies found.
MAXBlue (3" Tablets, Pool chemical)	Hypochlorite from trichloroisocyanurate	"Good degradation" (Oudejans, 2023).	No studies found.

Table 7. Effectiveness of Cleaning Products on Fentanyl and Methamphetamine in Textiles

Product Name	Cleaning Agent	Effectiveness against fentanyl	Effectiveness against methamphetamine
"Household detergent" plus washing machine	"Household detergent," no additional information provided.	No studies found.	Tight weave denim: 99.4% removed after one wash, 99.7% after two washes, 99.8% after three washes. Loose weave cotton blanket: 99.8% removed after one wash, 99.9% after two washes, 99.8% after three washes. (Serrano et al, 2012)

Table 8. Effectiveness of Other Ingredients (Not Available for Purchase) on Fentanyl and Methamphetamine

Product Name	Cleaning Agent	Effectiveness Against Fentanyl	Effectiveness Against Methamphetamine
Hydrochloric acid	HCl 6 M	No degradation (of both fentanyl and carfentanil). (Lindén et al., 2024)	No studies found.
Sodium hydroxide	NaOH 5%	Low degradation: more than 50% of fentanyl remaining after one hour and/or detectable amounts still remaining after 24 hours. None for carfentanil. (Lindén et al., 2024)	No studies found.
Cerium dioxide	CeO_2 (dry)	Low degradation: more than 50% of fentanyl and carfentanil remaining after one hour and/or detectable amounts still remaining after 24 hours. (Lindén et al., 2024)	No studies found.
Magnesium oxide	MgO (dry)	Low degradation: more than 50% of fentanyl and carfentanil remaining after one hour and/or detectable amounts still remaining after 24 hours. (Lindén et al., 2024)	No studies found.

TiO_2-ND	TiO_2-nanodiamond (dry)	Medium/high degradation: less than 20% of fentanyl and carfentanil remained after 10 minutes. (Lindén et al., 2024)	No studies found.
$KHSO_5$	$KHSO_5$, pH 5	24.3% degradation (after 5 minutes), 28% (10 minutes), 44.6% (30 minutes), 43.5% (60 minutes). (Qi et al, 2011)	No studies found.
Sodium percarbonate	Sodium percarbonate, pH 4	18.7% degradation (after 5 minutes), 36% (10 minutes), 24.4% (30 minutes), 45.3% (60 minutes). (Qi et al, 2011)	No studies found.
MMPP	Magnesium monoperoxyphthalate, pH 5	47% degradation (after 5 minutes), 52.1% (10 minutes), 63% (30 minutes), 76.5% (60 minutes). (Qi et al, 2011)	No studies found.
SPC+TAED	Sodium percarbonate/N,N,N,N-tetraacetylethylene diamine, pH 8 or pH 10	81.6% degradation (after 2 minutes), 91.9% (5 minutes), 92.4% (10 minutes), 95.7% (30 minutes), 98.6% (60 minutes): pH 8. 76.3% degradation (2 minutes), 81.2% (5 minutes), 91% (10 minutes), 91.4% (30 minutes), 93% (60 minutes): pH 10 (Qi et al, 2011).	No studies found.
$K_2S_2O_8$	$K_2S_2O_8$, pH 6	4% degradation (after 5 minutes), 6.4% (10 minutes), 33% (30 minutes), 45.6% (60 minutes). (Qi et al, 2011)	No studies found.

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DOH 334-517 January 2025