NIOSH

SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS

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INTRODUCTION

THIS IS A SUMMARY OF THE MAJOR ENVIRONMENTAL AND MEDICAL RECOMMENDATIONS FOUND IN THE CRITERIA DOCUMENTS PUBLISHED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH). THE INTENT OF THE TABLE IS TO PROVIDE A SUMMARY OF EACH OF THE RECOMMENDATIONS, AS WELL AS THE CURRENT FEDERAL STANDARD AND THE DATE OF TRANSMITTAL TO THE DEPARTMENT OF LABOR. IN ADDITION, THE SIGNIFICANT EFFECTS CONSIDERED IN THE DERIVATION OF THE RECOMMENDATIONS ARE PRESENTED. OTHER PERTINENT INFORMATION IS INCLUDED UNDER COMMENTS. NO ATTEMPT HAS BEEN MADE TO PROVIDE ALL THE DETAILS NECESSARY FOR A COMPLETE UNDERSTANDING OF THE DOCUMENTS IN THE TABLE.

A CHART IS ALSO INCLUDED SHOWING WHERE EACH OF THESE CRITERIA DOCUMENTS ARE AVAILABLE.

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NIOSH
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NIOSH DEVELOPS AND PERIODICALLY REVISES CRITERIA DOCUMENTS THAT RECOMMEND STANDARDS FOR OCCUPATIONAL EXPOSURE TO CHEMICAL AND PHYSICAL HAZARDS. NIOSH PUBLISHES THESE DOCUMENTS AFTER CRITICALLY EVALUATING ALL KNOWN AND AVAILABLE MEDICAL, BIOLOGICAL, ENGINEERING, CHEMICAL, AND TRADE DATA AND INFORMATION THAT MAY BE RELEVANT TO RECOMMENDING A STANDARD. INCLUDED AS A PART OF THE STANDARD IS A PERMISSIBLE EXPOSURE LEVEL; I.E., THE CONCENTRATION OF A SUBSTANCE IN THE OCCUPATIONAL ENVIRONMENT THAT WILL NOT CAUSE ADVERSE EFFECTS IN EXPOSED PERSONS.

THE PROCESS BEGINS WITH THE COLLECTION OF ALL PUBLISHED AND PUBLICLY AVAILABLE LITERATURE. THIS EVIDENCE IS CAREFULLY REVIEWED TO DETERMINE WHAT HAZARDOUS EFFECTS ARE RELEVANT IN DEVELOPING CRITERIA FOR THE PROPOSED STANDARDS. THE EXTENT OF HAZARD IS THEN DETERMINED FROM THE MOST PERTINENT INFORMATION. METHODS OF SAMPLING AND ANALYSIS ARE EVALUATED TO ENSURE THAT THOSE SELECTED CAN MEASURE THE SUBSTANCES IN THE CONCENTRATIONS THAT ARE EXPECTED TO BE FOUND IN THE WORKING ENVIRONMENT. THIS INFORMATION IS THEN USED TO DEVELOP THE FIRST DRAFT OF A CRITERIA DOCUMENT.

THE DRAFT IS REVIEWED AND CRITIQUED BY OUTSIDE PROFESSIONAL OCCUPATIONAL HEALTH PERSONNEL WHO ARE SELECTED NOT ONLY FOR THEIR EXPERIENCE WITH THE SUBJECT OF THE DOCUMENT, BUT ALSO FOR THEIR EMPLOYMENT ASSOCIATION. THIS SELECTION PROCESS IS INTENDED TO BRING FORTH DIVERGENT VIEWS FROM THAT OF THE ORIGINATORS AND THE NIOSH STAFF.

THE CONSULTANTS SELECTED FOR THIS REVIEW AND CRITIQUE WILL, IN MOST CASES, HAVE HAD DIRECT PERSONAL EXPERIENCE WITH THE HAZARD ADDRESSED AND WILL REFLECT EXPERIENCE IN OCCUPATIONAL MEDICINE, ENGINEERING, CHEMISTRY, TOXICOLOGY, INDUSTRIAL HYGIENE, OR OTHER PERTINENT OCCUPATIONAL SAFETY OR HEALTH FIELDS. CONSULTANTS ARE CHOSEN FROM INDUSTRY, STATE OR LOCAL GOVERNMENT OCCUPATIONAL HEALTH STAFFS, ORGANIZED LABOR, AND UNIVERSITIES. THE SELECTED CONSULTANTS PROVIDE A REASONABLY BALANCED GROUP WITH BROAD EXPERIENCE. NONE OF THE SELECTED PARTICIPANTS SHOULD HAVE BEEN INVOLVED IN THE INITIAL FORMULATION OF THE SPECIFIC CRITERIA DOCUMENT.

SINCE BIAS COULD BE INTRODUCED THROUGH THE SELECTION PROCESSES, SOCIETIES WHOSE MEMBERSHIP INCLUDES EXPERIENCED PROFESSIONALS IN THE OCCUPATIONAL HEALTH FIELD ARE INVITED TO REVIEW THE CRITERIA DOCUMENT DRAFT. THE SOCIETIES HAVE INCLUDED THE SOCIETY OF TOXICOLOGY, THE AMERICAN INDUSTRIAL HYGIENE ASSOCIATION, THE AMERICAN OCCUPATIONAL MEDICAL ASSOCIATION, THE AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS, THE AMERICAN ACADEMY OF OCCUPATIONAL MEDICINE, THE AMERICAN ACADEMY OF INDUSTRIAL HYGIENE, THE SOCIETY FOR OCCUPATIONAL AND ENVIRONMENTAL HEALTH, AND THE AMERICAN MEDICAL ASSOCIATION. THE ONLY CONSTRAINTS PLACED UPON THE ORGANIZATIONS IN THE SELECTION OF REVIEWERS IS THAT THEY BE MEMBERS OF THAT PARTICULAR ORGANIZATION AND THAT THEY NOT HAVE BEEN INVOLVED IN ANY OF THE OTHER PAST OR CURRENT PREPARATION ACTIVITIES OF THE CRITERIA DOCUMENT BEING REVIEWED. ADDITIONAL VIEW-POINTS ARE SOLICITED FROM GOVERNMENTAL AGENCIES THAT MAY HAVE INTEREST AND EXPERIENCE IN THE CONTROL OF OCCUPATIONAL OR ENVIRONMENTAL HAZARDS.

COMMENTS AND CRITIQUES OF ALL REVIEWERS ARE ORGANIZED WITH THE FINAL DRAFT WHICH THEN UNDERGOES A THOROUGH OBJECTIVE REVIEW BY SENIOR NIOSH PROFESSIONALS SELECTED FOR THEIR EXPERIENCE IN OCCUPATIONAL HEALTH. THIS SENIOR REVIEW STAFF WILL THEN PROVIDE THE DIRECTOR OF NIOSH WITH RECOMMENDATIONS BASED ON THEIR REVIEW. THE "CRITERIA FOR A RECOMMENDED STANDARD FOR OCCUPATIONAL EXPOSURE TO (A HAZARDOUS SUBSTANCE)" IS FINALIZED AFTER THE DIRECTOR'S REVIEW AND APPROVED BY HIM FOR TRANSMITTAL TO THE DEPARTMENT OF LABOR. THE FINAL DOCUMENT DOES NOT, THEREFORE, NECESSARILY OFFER A TRUE CONSENSUS OR COINCIDE WITH THE COMMENTS OF ALL REVIEWERS.

THE RESULTING CRITERIA DOCUMENT PROVIDES A VALID AND DETAILED RECOMMENDATION WITH SUPPORTING INFORMATION TO BE USED BY THE DEPARTMENT OF LABOR AS A BASIS FOR PROMULGATION OF A OCCUPATIONAL HEALTH STANDARD.

AFTER TRANSMITTAL, THE RECOMMENDATIONS ARE AVAILABLE TO FOREIGN, STATE, AND LOCAL GOVERNMENTS AS WELL AS INDUSTRY AND THE GENERAL PUBLIC FOR THEIR INFORMATION AND APPROPRIATE USE.

PERIODICALLY, AS A RESULT OF NEW INFORMATION ASSEMBLED DURING SYSTEMATIC UPDATES OF COMPLETED CRITERIA DOCUMENTS OR FROM SIGNIFICANT NEW DEVELOPMENTS PERTAINING TO THE HAZARD, NIOSH REVISES CRITERIA DOCUMENTS. THE REVISION PROCESS IS DESIGNED TO INCORPORATE THE SAME BASIC PRINCIPLES USED FOR THE ORIGINAL DOCUMENT TO INSURE A CRITICAL, UNBIASED REVIEW OF ALL PERTINENT INFORMATION.

SPECIAL HAZARD REVIEWS

THE NIOSH SPECIAL HAZARD REVIEW SUPPORTS AND COMPLEMENTS THE OTHER STANDARDS ACTIVITIES OF THE INSTITUTE. THEIR PURPOSE IS TO ASSESS, FROM A HEALTH STANDPOINT, SPECIFIC PROBLEMS ASSOCIATED WITH A GIVEN AGENT OR HAZARD SUCH AS A POTENTIAL FOR CARCINOGENIC. MUTAGENIC, OR TERATOGENIC EFFECTS AND TO RECOMMEND APPROPRIATE CONTROL AND SURVEILLANCE METHODS. WHILE THEY ARE NOT INTENDED TO SUPPLANT THE MORE COMPREHENSIVE NIOSH CRITERIA DOCUMENTS NOR THE BRIEF NIOSH CURRENT INTELLIGENCE BULLETINS, THEY ARE PREPARED IN SUCH A WAY AS TO ASSIST IN THE FORMULATION OF REGULATIONS.

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SUBSTANCE	TRANSMITTED TO OSHA	CURRENT OSHA ENVIRONMENTAL STANDARD	NIOSH RECOMMENDATION FOR ENVIRONMENTAL EXPOSURE LIMIT	HEALTH EFFECT CONSIDERED	COMMENTS
ACETYLENE	JULY 1, 1976	2,500-PPM (10% OF LOWER EXPLOSIVE LIMIT)	NO EXPOSURE IN EXCESS OF 2,500-PPM (2,662 MG/CU M)	INDIRECT ASPHYXIA	EMPLOYERS TO CHECK FOR, AND INFORM EMPLOYEES OF CONTAMINANTS SUCH AS ARSINE AND PHOSPHINE
ACRYLAMIDE	OCTOBER 21, 1976	0.3 MG/CU M, 8-HR TWA (SKIN)	0.3 MG/CU M TWA	SKIN, EYE, NERVOUS SYSTEM EFFECTS	SKIN AND EYE CONTACT TO BE PREVENTED
ACRYLONITRILE	SEPTEMBER 28, 1977	20-PPM, 8-HR TWA (SKIN)	NOT GREATER THAN 4-PPM BY RECOMMENDED METHOD (8.7 MG/CU M)	LUNG AND BOWEL CANCER	CHEST X-RAY REQUIRED. FIRST AID AND MEDICAL KITS TO BE AVAILABLE DURING USE. HAZARDOUS LIQUID, SKIN
ALDRIN/DIELDRIN (SPECIAL HAZARD REVIEW)	SEPTEMBER 7, 1978	0.25 MG/CU M, 8-HR TWA (SKIN)	LOWEST RELIABLY DETECTABLE LEVEL; 0.15 MG/CU M TWA BY NIOSH VALIDATED METHOD. SKIN CONTACT TO BE PREVENTED	CANCER	

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ALKANES (C5-C8)	MARCH 29, 1977	1000-PPM, 8-HR TWA, PENTANE; 500-PPM, 8-HR TWA, N-HEXANE, N-HEPTANE, OCTANE	350 MG/CU M TWA (APPROX. 120-PPM PENTANE; 100-PPM HEXANE; 85-PPM HEPTANE; 75-PPM OCTANE) MIXTURES TO BE NOT GREATER THAN 350 MG/CU M TWA; 1800 MG/CU M CEILING SINGLY OR MIXTURES (15-MINUTE)	SKIN AND NERVOUS SYSTEM EFFECTS	ACTION LEVEL DEFINED AS 200 MG/CU M FOR THESE SUBSTANCES
ALLYL CHLORIDE	SEPTEMBER 21, 1976	1-PPM, 8-HR TWA	1-PPM TWA (3.1 MG/CU M); 3-PPM CEILING (9.3 MG/CU M) (15-MINUTE)	LIVER, KIDNEY, LUNG EFFECTS	URINE, BLOOD, AND PULMONARY FUNCTION TESTING REQUIRED
AMMONIA	JULY 15, 1974	50-PPM; 8-HR TWA	50-PPM CEILING (34.8 MG/CU M) (5-MINUTE)	AIRWAY IRRITATION	HAZARDOUS LIQUID EYE DAMAGE
ANTIMONY	SEPTEMBER 28, 1978	0.5 MG/CU M, 8-HR TWA	0.5 MG/CU M TWA	IRRITATION; HEART AND LUNG EFFECTS	CHEST X-RAY, PULMONARY FUNCTION, AND ELECTROCARDIOGRAM TESTING REQUIRED
ARSENIC INORGANIC	JANUARY 21, 1974 REVISED JUNE 23, 1975	0.5 MG AS/CU M TWA	2 UG AS/CU M CEILING (15-MINUTE)	DERMATITIS, LUNG AND LYMPHATIC CANCER	CHEST X-RAYS REQUIRED

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ASBESTOS	JANUARY 21, 1972 REVISED DECEMBER 15, 1976	2,000,000 FIBERS/CU M 8-HR TWA 10,000,000 FIBERS/CU M CEILING	100,000 FIBERS/CU M OVER 5 MICRONS TWA; 500,000 FIBERS/CU M OVER 5 MICRONS CEIL- ING; (15-MINUTE)	ASBESTOSIS, LUNG CANCER	FEDERAL STANDARD PROMULGATED JULY 7, 1972; TWA LOWERED JULY 1, 1976
ASPHALT FUMES	SEPTEMBER 27, 1977	2.5 MG/CU M	5 MG/CU M CEILING (15-MINUTE)	EYE AND RESPIRATORY IRRITATION	HAZARDOUS SUB- STANCE, SKIN
BENZENE	JULY 24, 1974 REVISED JULY 25, 1977 *	10-PPM, 8-HR TWA; 25-PPM ACCEPTABLE CEILING; 50-PPM MAXIMUM CEILING (10-MINUTE)	1-PPM CEILING (3.2 MG/CU M) (60-MINUTE)	BLOOD CHANGES INCLUDING LEUKEMIA	BLOOD TESTING REQUIRED
BENZOYL PEROXIDE	JUNE 7, 1977	5 MG/CU M, 8-HR TWA	5 MG/CU M TWA	AIRWAY AND EYE IRRITA- TION, SKIN EFFECTS	
BENZYL CHLORIDE	AUGUST 22, 1978	1-PPM (5 MG/CU M) 8-HR TWA	5 MG/CU M CEILING (15-MINUTE)	IRRITATION; SKIN AND EYE EFFECTS	CHEST X-RAY AND PULMONARY FUNCTION TESTING REQUIRED
BERYLLIUM	JUNE 30, 1972 REVISED AUGUST 19, 1977 *	2 UG/CU M, 8-HR TWA 5 UG/CU M ACCEPTABLE CEILING; 25 UG/CU M MAXIMUM CEILING (30-MINUTE)	.5 UG/CU M (130-MINUTE)	LUNG CANCER	PULMONARY FUNC- TION CHEST X-RAY, AND SPUTUM CYTOLOGY REQUIRED

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BORON TRIFLUORIDE	DECEMBER 15, 1976	1-PPM CEILING	NONE RECOMMENDED	RESPIRATORY SYSTEM EFFECTS	ADEQUATE PROCEDURES FOR SAMPLING AND ANALYSIS NOT AVAILABLE; PULMONARY FUNCTION TESTING REQUIRED
CADMIUM	AUGUST 23, 1976	0.1 MG/CU M, 8-HR TWA; 0.3 MG/CU M CEILING (FUME; ERRONEOUSLY PUBLISHED AS 3 MG/CU M) 0.2 MG/CU M, 8-HR TWA; 0.6 MG/CU M CEILING (DUST)	40 UG CD/CU M TWA; 200 UG CD/CU M CEILING (15-MINUTE)	LUNG AND KIDNEY EFFECTS	URINE AND PULMONARY FUNCTION TESTING REQUIRED
CARBARYL	SEPTEMBER 30, 1976	5 MG/CU M, 8-HR TWA	5 MG/CU M TWA	NERVOUS AND REPRODUCTIVE SYSTEM EFFECTS	MEDICAL WARNINGS OF POSSIBLE EFFECTS ON REPRODUCTIVE SYSTEM AND MINIMUM EXPOSURE DURING PREGNANCY REQUIRED; SKIN AND EYE CONTACT TO BE PREVENTED
CARBON BLACK	SEPTEMBER 7, 1978	3.5 MG/CU M, 8-HR TWA	3.5 MG/CU M TWA; 0.1 MG/CU M TWA IN PRESENCE OF POLYCYCLIC AROMATIC HYDROCARBONS	LUNG, HEART, AND SKIN EFFECTS; CANCER	CHEST X-RAYS, PULMONARY FUNCTION TESTING, ECG, AND SPUTUM CYTOLOGY REQUIRED

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CARBON DIOXIDE	AUGUST 11, 1976	5,000-PPM, 8-HR TWA	10,000-PPM TWA (18,000 MG/CU M) 30,000-PPM CEILING (54,000 MG/CU M) (10-MINUTE)	RESPIRATORY EFFECTS	
CARBON DISULFIDE	MAY 4, 1977	20-PPM, 8-HR TWA; 30-PPM ACCEPTABLE CEILING; 100-PPM MAXIMUM CEILING	1-PPM TWA (3 MG/CU M); 10-PPM CEILING (30 MG/CU M) (15-MINUTE)	HEART, NERVOUS AND REPRODUCTIVE SYSTEM EFFECTS	EMPLOYEES TO BE ADVISED OF POTENTIAL EFFECTS ON REPRODUCTIVE SYSTEM
CARBON MONOXIDE	AUGUST 3, 1972	50-PPM, 8-HR TWA	35-PPM TWA (40 MG/CU M); 200-PPM CEILING (229 MG/CU M)	HEART EFFECTS	
CARBON TETRA-CHLORIDE	DECEMBER 22, 1975 REVISED JUNE 9, 1976	10-PPM, 8-HR TWA 25-PPM ACCEPTABLE CEILING; 200-PPM MAXIMUM CEILING (5-MINUTE IN 4 HOURS)	2-PPM CEILING (12.6 MG/CU M) (60-MINUTE)	LIVER CANCER	
CHLORINE	MAY 25, 1976	1-PPM, 8-HR TWA	0.5-PPM CEILING (1.45 MG/CU M) (15-MINUTE)	EYE/AIRWAY IRRITATION	CHEST X-RAYS REQUIRED

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CHLOROFORM	SEPTEMBER 11, 1974 REVISED JUNE 9, 1976	50-PPM CEILING	2-PPM CEILING (9.78 MG/CU M) (60-MINUTE)	LIVER OR KIDNEY TUMORS AND CENTRAL NERVOUS SYSTEM EFFECTS	CURRENT FEDERAL STANDARD SHOULD BE TWA: PUBLISHED AS "C" IN ERROR
CHLOROPRENE	AUGUST 12, 1977	25-PPM, 8-HR TWA	1-PPM CEILING (3.6 MG/CU M) (15-MINUTE)	REPRODUCTIVE EFFECTS; POTENTIAL FOR CANCER	CHEST X-RAY AND PULMONARY FUNCTION TESTING REQUIRED; MEDICAL WARNINGS TO WORKERS CONCERNING REPRODUCTIVE EFFECTS IN ANIMALS; PREGNANT WORKERS TO BE COUNSELED ABOUT CONTINUING WORK WITH CHLOROPRENE
CHROMIC ACID	JULY 17, 1973	1 MG/10 CU M CEILING	0.05 MG CR03/CU M TWA 0.1 MG CR03/CU M CEILING (15-MINUTE)	NASAL ULCERATION	
CHROMIUM (VI)	DECEMBER 1, 1975	100 UG/10 CU M CEILING	1 UG/CU M FOR CARCINOGENIC CR (VI); 25 UG/CU M TWA FOR OTHER CR(VI); 50 UG/CU M CEILING (15-MINUTE)	LUNG CANCER, SKIN ULCERS, LUNG IRRITATION	EMPLOYER MUST DEMONSTRATE ABSENCE OF CARCINOGENIC CR(VI); X-RAY REQUIRED

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OCTOBER, 1978

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CHRYSENE (SPECIAL HAZARD REVIEW)	JUNE 2, 1978	NONE	TO BE CONTROLLED AS AN OCCUPATIONAL CARCINOGEN	CANCER	CONTROL RECOMMENDATIONS ALSO INCLUDED FOR POLYCYCLIC AROMATIC HYDROCARBONS
COAL GASIFICATION PLANTS	SEPTEMBER 7, 1978	EXISTING FEDERAL OCCUPATIONAL EXPOSURE LIMITS OR NIOSH RECOMMENDED LIMITS TO BE ENFORCED		VARIOUS EFFECTS DEPENDING ON SUBSTANCES PRESENT. CARCINOGENIC POTENTIAL.	EXTENSIVE WORK PRACTICE AND CONTROL PROCEDURES RECOMMENDED. DOCUMENT LIMITED TO THOSE TECHNOLOGIES MOST LIKELY TO BE OPERATIONAL IN THE U.S.
COAL TAR PRODUCTS	SEPTEMBER 27, 1977	NONE	0.1 MG/CU M TWA, (CYCLOHEXANE-EXTRACTABLE FRACTION)	LUNG AND SKIN CANCER	INCLUDES COAL TAR, CREOSOTE, AND COAL TAR PITCH. PULMONARY FUNCTION TESTING, CHEST X-RAYS, AND SPUTUM CYTOLOGY REQUIRED

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OCTOBER, 1978

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COKE OVEN EMISSIONS	FEBRUARY 28, 1973	150 UG/CU M TWA	WORK PRACTICES TO MINIMIZE EXPOSURE TO EMISSIONS	LUNG CANCER	SPUTUM CYTOLOGY AND CHEST X-RAY REQUIRED. FEDERAL STANDARD PROMULGATED OCT. 22, 1976
COTTON DUST	SEPTEMBER 26, 1974	200 UG/CU M, 8-HR TWA (YARN MANUFACTURING); 750 UG/CU M, 8-HR TWA (SLASHING AND WEAVING OPERATIONS); 500 UG/CU M, 8-HR TWA (ALL OTHER OPERATIONS)	200 UG/CU M LINT-FREE COTTON DUST	PULMONARY DISEASE (BYSSINOSIS)	PULMONARY FUNCTION TESTING REQUIRED. FEDERAL STANDARD PROMULGATED JUNE 23, 1978
CRESOL	FEBRUARY 28, 1978	22 MG/CU M 8-HR TWA "SKIN"	10 MG/CU M TWA	SKIN, LIVER, KIDNEY, AND PANCREAS EFFECTS.	APPLIES TO MIXTURES OF CRESOLS AND CRESYLIC ACID. HAZARDOUS SUBSTANCE, SKIN AND EYES. POSSIBLE DELAYED EFFECTS

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CYANIDE, HYDROGEN AND CYANIDE SALTS	OCTOBER 4, 1976	10-PPM, 8-HR TWA (ALKALI CYANIDES) CYANIDE 5 MG CN/ CU M (SKIN)	5 MG CN/CU M CEILING (4.7-PPM) (10-MINUTE)	THYROID, BLOOD, RESPIRATORY SYSTEM EFFECTS	CONCURRENT MEASURMENT REQUIRED FOR HCN WHEN MEASURING FOR CYANIDE SALT; TRAINED FIRST-AID PERSONNEL AND FIRST-AID KITS TO BE AVAILABLE DURING USE. HAZARDOUS LIQUID, SKIN AND EYE
DDT (SPECIAL HAZARD REVIEW)	SEPTEMBER 7, 1978	1 MG/CU M, 8-HR TWA (SKIN)	LOWEST RELIABLY DETECTABLE LEVEL; 0.5 MG/CU M TWA BY NIOSH VALIDATED METHOD. SKIN CONTACT TO BE AVOIDED	CANCER	
DECOMPOSITION PRODUCTS OF FLUOROCARBON	SEPTEMBER 26, 1977	NONE	NONE RECOMMENDED	LUNG EFFECTS, POLYMER FUME FEVER	WORKROOM AIR TO BE MONITORED FOR INORGANIC FLUORIDES AND HYDROGEN FLUORIDE

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DIBROMOCHLORO-PROPANE	SEPTEMBER 2, 1977	1-PPB, 8-HR TWA; EYE AND SKIN CONTACT TO BE AVOIDED	10-PPB CEILING (0.1 MG/CU M) (30-MINUTE)	STERILITY; RENAL AND LIVER EFFECTS	MEDICAL WARNINGS TO WORKERS OF REPRODUCTIVE SYSTEM ABNORMALITIES INCLUDING STERILITY, AND NOTICE OF FINDINGS OF CANCER IN ANIMALS FOLLOWING DIRECT GASTRIC APPLICATION. FEDERAL STANDARD PROMULGATED MARCH 17, 1978

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DIISOCYANATES	SEPTEMBER 27, 1978	0.02-PPM (0.14 MG/CU M) CEILING (TDI); 0.02-PPM (0.2 MG/CU M) CEILING (MDI)	ALL VALUES ARE IN (UG/CU M) TOLUENE DIISOCYANATE (TDI): 35 TWA, 140 CEILING; DIPHENYLMETHANE DIISOCYANATE (MDI): 50 TWA, 200 CEILING; HEXAMETHYLENE DIISOCYANATE (HDI): 35 TWA, 140 CEILING; NAPTHALENE DIISOCYANATE (NDI): 40 TWA, 170 CEILING; ISOPHORENE DIISOCYANATE (IPDI): 45 TWA, 180 CEILING; DICYCLOHEXYLMETHANE 4,4'-DIISOCYANATE (HYDROGENATED MDI): 55 TWA, 210 CEILING; OTHER DIISOCYANATES TO BE CONTROLLED TO 20-PPB CEILING AND 5-PPB TWA	RESPIRATORY EFFECTS AND SENSITIZATION; IRRITATION	CHEST X-RAY AND PULMONARY FUNCTION TESTING REQUIRED
DINITRO-ORTHO-CRESOL	FEBRUARY 28, 1978	0.2 MG/CU M 8-HR TWA "SKIN"	0.2 MG/CU M TWA	CNS AND METABOLIC EFFECTS	BLOOD AND URINE MONITORING REQUIRED. HAZARDOUS SUBSTANCE, SKIN AND EYES. POSSIBLE DELAYED EFFECTS.

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DIOXANE	SEPTEMBER 1, 1977	100-PPM, 8-HR TWA (SKIN)	1-PPM CEILING (3.6 MG/CU M) (30-MINUTE)	LIVER AND KIDNEY EFFECTS; CANCER	BLOOD AND URINE TESTING REQUIRED; HAZARDOUS LIQUID, SKIN
EPICHLOROHYDRIN	SEPTEMBER 17, 1976	5-PPM, 8-HR TWA (20 MG/CU M)	2 MG/CU M TWA; 19 MG/CU M CEILING (15-MINUTE)	SKIN, KIDNEY, LIVER, AND RESPIRATORY SYSTEM EFFECTS	MEDICAL WARNING INFERTILITY EFFECTS REQUIRED; HAZARDOUS LIQUID, SKIN
ETHYLENE DIBROMIDE	AUGUST 25, 1977	20-PPM, 8-HR TWA; 30-PPM ACCEPTABLE CEILING; 50-PPM MAXIMUM PEAK (5-MINUTE)	1 MG/CU M CEILING (0.13-PPM) (15-MINUTE)	DAMAGE TO SKIN, EYES, HEART, LIVER, SPLEEN, RESPIRATORY AND CENTRAL NERVOUS SYSTEMS. POTENTIAL FOR CANCER AND MUTAGENESIS	MEDICAL WARNINGS TO WORKERS OF POTENTIAL REPRODUCTIVE ABNORMALITIES AND CANCER FOLLOWING DIRECT ADMINISTRATION IN ANIMALS; HAZARDOUS LIQUID, CONTACT TO BE PREVENTED
ETHYLENE DICHLORIDE	MARCH 9, 1976 REVISED SEPTEMBER 29, 1978 (SPECIAL HAZARD REVIEW)	50-PPM, 8-HR TWA; 100-PPM ACCEPTABLE CEILING; 200-PPM MAXIMUM CEILING (5-MINUTES IN 3 HOURS)	1 PPM TWA (4 MG/CU M); 2-PPM CEILING (2 MG/CU M) (15-MINUTE)	CANCER; NERVOUS SYSTEM, RESPIRATORY, HEART, AND LIVER EFFECTS	NURSING INFANTS AT RISK

NIOSH TWA RECOMMENDATIONS BASED ON UP TO A 10-HR EXPOSURE UNLESS OTHERWISE NOTED.

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SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS
OCTOBER, 1978

SUBSTANCE	TRANSMITTED TO OSHA	CURRENT OSHA ENVIRONMENTAL STANDARD	NIOSH RECOMMENDATION FOR ENVIRONMENTAL EXPOSURE LIMIT	HEALTH EFFECT CONSIDERED	COMMENTS
ETHYLENE OXIDE (SPECIAL HAZARD REVIEW)	SEPTEMBER 9, 1977	90 MG/CU M (50-PPM), 8-HR TWA	90 MG/CU M (50-PPM) TWA; 135 MG/CU M (75-PPM) CEILING (15-MINUTE)	MUTAGENESIS; CANCER	RECOMMENDATIONS FOR BLOOD MONITORING AND MEDICAL COUNSELING CONCERNING MUTATIONS FOUND IN ANIMAL TESTS
ETHYLENE THIOUREA (SPECIAL HAZARD REVIEW)	OCTOBER 13, 1978	NONE	USE OF ENCAPSULATED FORM IN INDUSTRY; WORKER EXPOSURE TO BE MINIMIZED	CARCINOGENESIS AND TERATOGENESIS	WORKERS TO BE INFORMED OF CARCINOGENIC AND TERATOGENIC HAZARDS. SPECIAL ATTENTION TO BE GIVEN TO THYROID FUNCTION TESTS
FIBROUS GLASS	APRIL 15, 1977	15 MG/CU M TOTAL DUST; 5 MG/CU M RESPIRABLE FRACTION (NUISANCE DUST)	3,000,000 FIBERS/CU M TWA (FIBERS < 3.5 MICRONS DIAMETER AND > 10 MICRONS LENGTH); 5 MG/CU M TWA (TOTAL FIBROUS GLASS)	EYE AND SKIN AND AIRWAY EFFECTS	NIOSH RECOMMENDS THIS LIMIT ALSO APPLY TO OTHER MAN-MADE FIBERS
FLUORIDES, INORGANIC	JUNE 30, 1975	2.5 MG/CU M, 8-HR TWA	2.5 MG F/CU M TWA	KIDNEY AND BONE EFFECTS	URINE MONITORING REQUIRED
FORMALDEHYDE	DECEMBER 30, 1976	3-PPM, 8-HR TWA; 5-PPM ACCEPTABLE CEILING; 10-PPM MAXIMUM CEILING (30-MINUTE)	1.2 MG/CU M CEILING (1-PPM) (30-MINUTE)	IRRITATION, LUNG EFFECTS	HAZARDOUS LIQUID, SKIN

NIOSH TWA RECOMMENDATIONS BASED ON UP TO A 10-HR EXPOSURE UNLESS OTHERWISE NOTED.

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SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS
OCTOBER, 1978

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GLYCIDYL ETHERS	JUNE 30, 1978	45 MG/CU M, CEILING (ALLYLGLYCIDYL ETHER); 270 MG/CU M, 8-HR TWA (N-BUTYL GLYCIDYL ETHER); 2.8 MG/CU M, 8-HR TWA (DI2,3-EPOXYPROPYL ETHER); 240 MG/CU M 8-HR TWA (ISOPROPYL GLYCIDYL ETHER); 60 MG/CU M 8-HR TWA, (PHENYL GLYCIDYL ETHER)	45 MG/CU M (AGE); 30 MG/CU M (BGE); 1 MG/CU M (DGE); 240 MG/CU M (IGE); 5 MG/CU M (PGE); ALL CEILING VALUES (15-MINUTE)	SKIN, MUCOUS MEMBRANE EFFECTS, SENSITIZATION POTENTIAL. TUMORIGENESIS AND MUTAGENESIS	POSSIBLE ADDITIVE EFFECTS WITH MIXTURES
HOT ENVIRONMENTS	JUNE 30, 1972	NONE	VARIABLE (SLIDING SCALE)	HEAT STRESS	ACCLIMATIZATION REQUIRED
HYDRAZINES	JUNE 30, 1978	1.3 MG/CU M(HYDRAZINE), 1.0 MG/CU M (1,1-DIMETHYL-HYDRAZINE), 22 MG/CU M (PHENYL-HYDRAZINE) AS 8-HR TWA VALUES; 0.35 MG/CU M CEILING (METHYL-HYDRAZINE)	0.04 MG/CU M (HYDRAZINE), 0.15 MG/CU M (1.1-DIMETHYL-HYDRAZINE), 0.6 MG/CU M (PHENYL-HYDRAZINE), 0.08 MG/CU M (METHYL-HYDRAZINE). ALL AS CEILING VALUES (120-MINUTE)	LIVER, BLOOD, EYE, SKIN EFFECTS; CANCER	BLOOD AND URINE MONITORING, CHEST X-RAY REQUIRED. BOWEL EXAMINATION REQUIRED FOR SOME WORKERS
HYDROGEN FLUORIDE	MARCH 9, 1976	3-PPM, 8-HR TWA	2.5 MG F/CU M TWA (APPROX. 6-PPM); 5.0 MG/CU M CEILING (APPROX. 12-PPM) (15-MINUTE, FLUROIDE ION)	SKIN/EYE/AIRWAY IRRITATION; BONE EFFECTS	PELVIC X-RAY (MALE) AND URINE TESTING REQUIRED

NIOSH TWA RECOMMENDATIONS BASED ON UP TO A 10-HR EXPOSURE UNLESS OTHERWISE NOTED.

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SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS
OCTOBER, 1978

SUBSTANCE	TRANSMITTED TO OSHA	CURRENT OSHA ENVIRONMENTAL STANDARD	NIOSH RECOMMENDATION FOR ENVIRONMENTAL EXPOSURE LIMIT	HEALTH EFFECT CONSIDERED	COMMENTS
HYDROGEN SULFIDE	MAY 4, 1977	20-PPM ACCEPTABLE CEILING; 50-PPM MAXIMUM CEILING (10-MINUTE)	15 MG/CU M CEILING (APPROX. 10-PPM) (10-MINUTE)	IRRITATION; SEVERE ACUTE EFFECTS, NERVOUS AND RESPIRATORY SYSTEMS	CONTINUOUS MONITORING REQUIRED IF POTENTIAL EXISTS FOR EXPOSURE TO 70 MG/CU M OR GREATER; EVACUATION REQUIRED AT THIS LEVEL
HYDROQUINONE	APRIL 21, 1978	2 MG/CU M, 8-HR TWA	2 MG/CU M CEILING (15-MINUTE)	EYE AND SKIN EFFECTS	SPECIAL PROVISIONS FOR DARKROOM USE
ISOPROPYL ALCOHOL	MARCH 9, 1976	400-PPM, 8-HR TWA	400-PPM TWA, (984 MG/CU M); 800-PPM CEILING (1968 MG/CU M) (15-MINUTE)	MUCOUS MEMBRANE IRRITATION; POSSIBLE CANCER THREAT IN MANUFACTURING PROCESS	MORE STRINGENT WORK PRACTICES AND MEDICAL SURVEILLANCE FOR MANUFACTURING WORKERS
KEPONE	JANUARY 27, 1976	NONE	1 UG/CU M CEILING (15-MINUTE)	NERVOUS SYSTEM EFFECTS; LIVER CANCER	LIVER FUNCTION TESTING REQUIRED

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SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS
OCTOBER, 1978

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KETONES	JUNE 30, 1978	ACETONE 2,400 MG/CU M	590 MG/CU M TWA	IRRITATION; LIVER, KIDNEY AND NERVOUS SYSTEM EFFECTS	URINALYSIS REQUIRED. WARNING OF NERVOUS SYSTEM EFFECTS IN WORKERS EXPOSED TO METHYL N-BUTYL KETONE
		METHYL ETHYL KETONE 590 MG/CU M	590 MG/CU M TWA		
		METHYL N-PROPYL KETONE 700 MG/CU M	530 MG/CU M TWA		
		METHYL N-BUTYL KETONE 4L0 MG/CU M	4 MG/CU M TWA		
		METHYL N-AMYL KETONE 465 MG/CU M	465 MG/CU M TWA		
		METHYL ISOBUTYL KETONE 410 MG/CU M	200 MG/CU M TWA		
		METHYL ISOAMYL KETONE NONE	230 MG/CU M TWA		
		DIISOBUTYL KETONE 290 MG/CU M	140 MG/CU M TWA		
		CYCLOHEXANONE 200 MG/CU M	100 MG/CU M TWA		
		MESITYL OXIDE 100 MG/CU M	40 MG/CU M TWA		
		DIACETONE ALCOHOL 240 MG/CU M	240 MG/CU M TWA		
		ISOPHORONE 140 MG/CU M	23 MG/CU M TWA		
		ALL VALUES 8-HR. TWA			
LEAD, INORGANIC	JANUARY 5, 1973 MARCH, 1977 *	0.2 MG/CU M, 8-HR TWA	LESS THAN 100 UG/CU M	KIDNEY, BLOOD, AND NERVOUS SYSTEM EFFECTS	AIR LEVEL TO BE MAINTAINED SO THAT WORKER BLOOD LEAD REMAINS AT OR BELOW .060 MG/100G; BLOOD MONITORING REQUIRED

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SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS
OCTOBER, 1978

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LOGGING-FROM FELLING TO FIRST HAUL	JULY 1, 1976	NOT APPLICABLE	EXTENSIVE WORK PRACTICE AND PERSONAL PROTECTION RECOMMENDATIONS	PRIMARILY TRAUMA AND FALLS	IMMUNIZATION AND FIRST-AID PROGRAMS TO BE INSTITUTED
MALATHION	JULY 1, 1976	15 MG/CU M, 8-HR TWA	15 MG/CU M TWA	NERVOUS SYSTEM EFFECTS	SKIN CONTACT TO BE PREVENTED; BLOOD MONITOR-ING REQUIRED
MERCURY, INORGANIC	JANUARY 5, 1973	0.1 MG/CU M CEILING	0.05 MG/CU M TWA	CENTRAL NERVOUS SYSTEM AND MENTAL EFFECTS	
METHYL ALCOHOL	MARCH 22, 1976	200-PPM TWA	200 PPM TWA (262 MG/CU M); 800-PPM CEILING (1048 MG/ CU M) (15-MINUTE)	BLINDNESS; METABOLIC ACIDOSIS	
4,4'-METHYLENE-BIS (2-CHLOROANILINE) (SPECIAL HAZARD REVIEW)	SEPTEMBER 7, 1978	NONE - STANDARD REMANDED BY COURT	3 UG/CU M TWA; SKIN CONTACT TO BE AVOIDED	CANCER	CHEST X-RAY, BLOOD AND URINE TESTING REQUIRED
METHYL PARATHION	SEPTEMBER 30, 1976	NONE	0.2.MG/CU M TWA	NERVOUS SYSTEM EFFECTS	SKIN CONTACT TO BE PREVENTED; BLOOD MONITOR-ING REQUIRED

NIOSH TWA RECOMMENDATIONS BASED ON UP TO A 10-HR EXPOSURE UNLESS OTHERWISE NOTED.

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SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS
OCTOBER, 1978

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METHYLENE CHLORIDE	MARCH 9, 1976	500-PPM, 8-HR TWA; 1000-PPM ACCEPTABLE CEILING; 2000-PPM MAXIMUM (5-MINUTES IN 2 HOURS)	75 PPM TWA (261 MG/CU M); 500-PPM CEILING (1740 MG/CU M) TO BE LOWERED IN PRESENCE OF CARBON MONOXIDE	CENTRAL NERVOUS SYSTEM EFFECTS; CARBON MONOXIDE TOXICITY	BLOOD MONITORING REQUIRED
NICKEL CARBONYL (SPECIAL HAZARD REVIEW)	MAY 27, 1977	7 UG/CU M (1-PPB), 8-HR TWA	7 UG/CU M (1-PPB) TWA	CANCER	RECOMMENDATIONS FOR CHEST X-RAY, PULMONARY FUNCTION AND URINE MONITORING
NICKEL, INORGANIC AND COMPOUNDS	MAY 13, 1977	1 MG/CU M, 8-HR TWA	15 UG NI/CU M TWA	SKIN EFFECTS; LUNG AND NASAL CANCER	CHEST X-RAY AND PULMONARY FUNCTION TESTING REQUIRED
NITRIC ACID	MARCH 9, 1976	2-PPM, 8-HR TWA	2-PPM TWA (5 MG/CU M)	DENTAL EROSION, NASAL/LUNG IRRITATION	HAZARDOUS LIQUID, EYES AND SKIN. CHEST X-RAY REQUIRED

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SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS
OCTOBER, 1978

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NITRILES	SEPTEMBER 27, 1978	70 MG/CU M (40-PPM), 8-HR TWA (ACETONITRILE); 3 MG/CU M (0.5-PPM), 8-HR TWA, "SKIN" (TETRAMETHYL-SUCCINONITRILE)	TO BE TWA VALUES: ACETONITRILE: 34 MG/CU M,(20-PPM); N-BUTYRONITRILE: 22 MG/CU M,(8-PPM); ISOBUTYRONITRILE: 22 MG/CU M,(8-PPM); PROPIONITRILE: 14 MG/CU M,(6-PPM); MALONONITRILE: 8 MG/CU M,(3-PPM); ADIPONITRILE: 18 MG/CU M,(4-PPM); SUCCINONITRILE: 20 MG/CU M,(6-PPM) TO BE CEILING VALUES (15-MINUTE): ACETONE CYANOHYDRIN: 4 MG/CU M,(1-PPM); GLYCOLONITRILE: 5 MG/CU M,(2-PPM); TETRAMETHYL SUCCINONITRILE: 6 MG/CU M,(1-PPM) WHEN PRESENT AS MIXTURES OR WITH OTHER SOURCES OF CYANIDE, EXPOSURE TO BE CONSIDERED ADDITIVE AND ENV-IRONMENTAL LIMIT TO BE CALCULATED	HEPATIC, RENAL, RESPIRATORY, CARDIOVAS-CULAR, GASTROINTESTINAL AND NERVOUS SYSTEM EFFECTS	CHEST X-RAY AND PULMONARY FUNC-TION TESTING RE-QUIRED. TRAINED PERSONNEL AND FIRST-AID KITS TO BE AVAILABLE DURING USE. HAZARDOUS SUB-STANCES, SKIN AND EYES

NIOSH TWA RECOMMENDATIONS BASED ON UP TO A 10-HR EXPOSURE UNLESS OTHERWISE NOTED.

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SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS
OCTOBER, 1978

SUBSTANCE	TRANSMITTED TO OSHA	CURRENT OSHA ENVIRONMENTAL STANDARD	NIOSH RECOMMENDATION FOR ENVIRONMENTAL EXPOSURE LIMIT	HEALTH EFFECT CONSIDERED	COMMENTS
NITROGEN, OXIDES	MARCH 22, 1976	NO2: 5-PPM, 8-HR TWA	NO2: 1-PPM (1.8 MG/CU M) CEILING (15-MINUTE)	AIRWAY EFFECTS	PULMONARY FUNCTION TESTING REQUIRED
		NO: 25-PPM, 8-HR TWA	NO: 25-PPM TWA (30 MG/CU M)	BLOOD EFFECTS	
NITROGLYCERIN: ETHYLENE GLYCOL DINITRATE	JUNE 30, 1978	2 MG/CU M (SKIN) 8-HR TWA (NITROGLYCERIN); 1 MG/CU M (SKIN) CEILING, (EDGN)	0.1 MG/CU M CEILING (20-MINUTE)	CIRCULATORY SYSTEM EFFECTS	SKIN CONTACT TO BE PREVENTED; RECOMMENDED LIMIT FOR EITHER SUBSTANCE ALONE OR MIXTURES
NOISE	AUGUST 10, 1972	90 DBA, 8-HR TWA	85 DBA TWA; 115 DBA CEILING	HEARING DAMAGE	
ORGANOTIN COMPOUNDS	NOVEMBER 12, 1976	0.1 MG TIN/CU M 8-HR TWA	0.1 MG TIN/CU M TWA	EYE, SKIN, LIVER, NERVOUS SYSTEM, AND HEART EFFECTS	CHEST X-RAY, BLOOD AND URINE MONITORING, EYE TESTS, HEART EXAMINATION, AND NERVOUS SYSTEM TESTING REQUIRED LIQUID, SKIN AND EYES
PARATHION	JUNE 30, 1976	0.11 MG/CU M TWA	0.05 MG/CU M TWA	NERVOUS SYSTEM EFFECTS	SKIN CONTACT TO BE PREVENTED; BLOOD MONITORING REQUIRED

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SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS
OCTOBER, 1978

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PESTICIDE MANUFACTURING AND FORMULATION	JULY 17, 1978	CURRENT OSHA OR FREVIOUSLY RECOMMENDED NIOSH LEVELS TO BE FOLLOWED. STRINGENT WORKPRACTICE AND MEDICAL SURVEILLANCE REQUIREMENTS TO BE INSTITUTED. PESTICIDES CONSIDERED IN 3 GROUPS BASED ON TOXICITY. SKIN CONTACT TO BE PREVENTED.		WIDE RANGE OF TOXICITIES CONSIDERED. NERVOUS AND REPRODUCTIVE SYSTEM EFFECTS. CANCER	BLOOD MONITORING REQUIRED FOR SOME GROUPS. MEDICAL WARNING OF REPRODUCTIVE SYSTEM EFFECTS IN SOME COMPOUNDS.
PHENOL	JUNE 30, 1976	5-PPM, 8-HR TWA (SKIN)	20 MG/CU M TWA (5.2 PPM); 60 MG/CU M CEILING (15.6 PPM) (15-MINUTE)	SKIN, EYE, CNS, LIVER, AND KIDNEY EFFECTS	HAZARDOUS SUBSTANCE, SKIN AND EYES
PHOSGENE	FEBRUARY 23, 1976	0.1-PPM, 8-HR TWA	0.1-PPM TWA (0.4 MG/CU M); 0.2-PPM CEILING (0.8 MG/CU M) (15-MINUTE)	AIRWAY EFFECTS	PULMONARY FUNCTION TESTING AND X-RAY REQUIRED
POLYCHLORINATED BIPHENYLS	SEPTEMBER 27, 1977	1 MG/CU M, 8-HR TWA (42% CHLORINE); 0.5 MG/CU M, 8-HR TWA (54% CHLORINE)	1 UG/CU M TWA	CANCER; SKIN, LIVER, AND REPRODUCTIVE EFFECTS	BLOOD TESTING REQUIRED. MEDICAL WARNING OF ADVERSE EFFECTS TO BE GIVEN TO WOMEN WORKERS OF CHILDBEARING AGE AND NURSING MOTHERS

NIOSH TWA RECOMMENDATIONS BASED ON UP TO A 10-HR EXPOSURE UNLESS OTHERWISE NOTED.

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SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS
OCTOBER, 1978

SUBSTANCE	TRANSMITTED TO OSHA	CURRENT OSHA ENVIRONMENTAL STANDARD	NIOSH RECOMMENDATION FOR ENVIRONMENTAL EXPOSURE LIMIT	HEALTH EFFECT CONSIDERED	COMMENTS
REFINED PETROLEUM SOLVENT	JULY 19, 1977	500-PPM, 8-HR TWA (2950 MG/CU M) (STODDARD SOLVENTS)	350 MG/CU M TWA; 1800 MG/CU M CEILING (15-MINUTE)	SKIN, LUNG, AND NERVE IRRITATION	BLOOD AND URINE MONITORING REQUIRED. ACTION LEVEL FOR PETROLEUM ETHER, RUBBER SOLVENT, NAPTHA BE 200 MG/CU M TWA; ACTION LEVEL FOR MINERAL SPIRITS AND STODDARD SOLVENT TO BE 350 MG CU M TWA; ACTION LEVEL FOR KEROSENE BE 100 MG/CU M TWA. HAZARDOUS SUBSTANCE SKIN
SILICA, CRYSTALLINE	NOVEMBER 11, 1974	250/%SIO + 5 IN MPPCF, OR 10 MG/CU M/%SI0+2 (RESPIRABLE QUARTZ)	50 UG/CU M TWA, RESPIRABLE FREE SILICA	CHRONIC LUNG DISEASE (SILICOSIS)	X-RAY, PULMONARY FUNCTION TESTING REQUIRED
SODIUM HYDROXIDE	SEPTEMBER 16, 1975	2 MG/CU M, 8-HR TWA	2 MG/CU M CEILING (15-MINUTE)	AIRWAY IRRITATION	HAZARDOUS LIQUID, EYES AND SKIN
SULFUR DIOXIDE	FEBRUARY 11, 1974 REVISED MAY 12, 1977 *	5-PPM, 8-HR TWA	0.5-PPM TWA (1.3 MG/CU M)	RESPIRATORY EFFECTS	PULMONARY FUNCTION TESTING REQUIRED
SULFURIC ACID	JUNE 6, 1974	1 MG/CU M, 8-HR TWA	1 MG/CU M TWA	PULMONARY IRRITATION	HAZARDOUS LIQUID, EYE AND SKIN

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SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS
OCTOBER, 1978

SUBSTANCE	TRANSMITTED TO OSHA	CURRENT OSHA ENVIRONMENTAL STANDARD	NIOSH RECOMMENDATION FOR ENVIRONMENTAL EXPOSURE LIMIT	HEALTH EFFECT CONSIDERED	COMMENTS
1,1,2,2-TETRA-CHLOROETHANE	DECEMBER 17, 1976	5-PPM; 8-HR TWA (SKIN)	1-PPM TWA (6.87 MG/CU M)	LIVER, GASTROINTESTINAL, AND NERVOUS SYSTEM EFFECTS	SKIN CONTACT TO BE PREVENTED. BLOOD MONITORING REQUIRED
TETRACHLORO-ETHYLENE	JULY 2, 1976	100-PPM, 8-HR TWA; 200-PPM ACCEPTABLE MAXIMUM CEILING; 300-PPM MAXIMUM CEILING (5-MINUTES IN 3 HOURS)	50-PPM TWA (339 MG/CU M); 100-PPM CEILING (678 MG/CU M) (15-MINUTE)	NERVOUS SYSTEM, HEART, RESPIRATORY, LIVER EFFECTS	MEDICAL WARNING OF POSSIBLE CON-GENITAL ABNOR-MALITIES REQUIRED

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SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS
OCTOBER, 1978

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THIOLS: N-ALKANE MONO,CYCLOHEXANE, AND BENZENE	SEPTEMBER 26, 1978	10-PPM, 8-HR TWA (BUTYLMERCAPTAN); 10-PPM CEILING (METHYL AND ETHYL MERCAPTAN)	CEILINGS 15-MINUTE: BENZENETHIOL: 0.5 MG/CU M,(0.1-PPM); 1-METHANETHIOL: 1.0 MG/CU M,(0.5-PPM); 1-ETHANETHIOL: 1.3 MG/CU M,(0.5-PPM); 1-PROPANETHIOL: 1.6 MG/CU M,(0.5-PPM); 1-BUTANETHIOL: 1.8 MG/CU M,(0.5-PPM); 1-PENTANETHIOL: 2.1 MG/CU M,(0.5-PPM); 1-HEXANETHIOL: 2.4 MG/CU M,(0.5-PPM); 1-HEPTANETHIOL: 2.7 MG/CU M,(0.5-PPM); 1-OCTANETHIOL: 3.0 MG/CU M,(0.5-PPM); 1-NONANETHIOL: 3.3 MG/CU M,(0.5-PPM); 1-DECANETHIOL: 3.6 MG/CU M,(0.5-PPM); 1-UNDECANETHIOL: 3.9 MG/CU M,(0.5-PPM); 1-DODECANETHIOL: 4.1 MG/CU M,(0.5-PPM); 1-HEXADECANETHIOL: 5.3 MG/CU M,(0.5-PPM); 1-OCTADECANETHIOL: 5.9 MG/CU M,(0.5-PPM); CYCLOHEXANETHIOL: 2.4 MG/CU M,(0.5-PPM); MIXTURES OF THIOLS TO BE CONTROLLED BY CALCULATION OF EQUIVALENT CONCENTRATIONS	IRRITATION, EYE, SKIN, BLOOD, AND NERVOUS SYSTEM EFFECTS	HAZARDOUS SUBSTANCE, SKIN. BLOOD AND URINE MONITORING REQUIRED

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SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS
OCTOBER, 1978

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O-TOLIDINE	AUGUST 11, 1978	NONE	20 UG/CU M CEILING SKIN CONTACT TO BE PREVENTED	NASAL IRRITATION; CANCER	URINE TESTING REQUIRED; QUARTERLY URINE MONITORING RECOMMENDED
TOLUENE	JULY 23, 1973	200-PPM, 8-HR TWA; 300-PPM ACCEPTABLE CEILING; 500-PPM MAXMIUM CEILING (10-MINUTE)	100-PPM TWA (375 MG/CU M); 200-PPM CEILING (750 MG/CU M) (10-MINUTE)	CENTRAL NERVOUS SYSTEM DEPRESSANT	
TOLUENE DIISOCYANATE	JULY 13, 1973 REVISED SEPTEMBER 27, 1978	0.02-PPM CEILING	0.005-PPM TWA (0.035 MG/CU M); 0.02 PPM CEILING (0.14 MG/CU M) (20-MINUTE)	AIRWAY EFFECTS	CHEST X-RAYS BLOOD TESTS, PULMONARY FUNCTION TESTING REQUIRED. RECOMMENDATIONS REVISED - SEE DIISOCYANATES
1,1,1,-TRICHLOROETHANE	JULY 2, 1976	350-PPM, 8-HR TWA	350-PPM CEILING (1910 MG/CU M) (15-MINUTE)	NERVOUS SYSTEM, LIVER, AND HEART EFFECTS	ACTION LEVEL SET AT 200-PPM TWA; MEDICAL WARNING OF POSSIBLE CONGENITAL ABNORMALITIES REQUIRED
TRICHLOROETHYLENE	JULY 23, 1973 REVISED FEBRUARY 28, 1978 (SPECIAL HAZARD REVIEW)	100-PPM, 8-HR TWA; 200-PPM ACCEPTABLE CEILING; 300-PPM MAXIMUM CEILING; (5-MINUTE IN ANY 2 HOURS)	25-PPM (134 MG/CU M) TWA	CENTRAL NERVOUS SYSTEM DEPRESSANT; CANCER	WORKERS TO BE WARNED OF HAZARDS

NIOSH TWA RECOMMENDATIONS BASED ON UP TO A 10-HR EXPOSURE UNLESS OTHERWISE NOTED.

* RECOMMENDATION REVISED AS A PART OF NIOSH TESTIMONY AT OSHA HEARING

SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS
OCTOBER, 1978

SUBSTANCE	TRANSMITTED TO OSHA	CURRENT OSHA ENVIRONMENTAL STANDARD	NIOSH RECOMMENDATION FOR ENVIRONMENTAL EXPOSURE LIMIT	HEALTH EFFECT CONSIDERED	COMMENTS
TUNGSTEN AND CEMENTED TUNGSTEN CARBIDE	SEPTEMBER 26, 1977	NONE	INSOLUBLE TUNGSTEN: 5 MG/CU M TWA; SOLUBLE TUNGSTEN: 1 MG/CU M TWA; DUST OF CEMENTED TUNGSTEN CARBIDE (> 2% COBALT): 0.1 MG COBALT/CU M TWA: DUST OF CEMENTED TUNGSTEN CARBIDE (> 0.3% NICKEL): 15 MICROGRAMS NICKEL/ CU M TWA	LUNG AND SKIN EFFECTS	PULMONARY FUNC-TION TESTING AND CHEST X-RAY REQUIRED
ULTRAVIOLET RADIATION	DECEMBER 20, 1972	10 MW/CM AVERAGED OVER ANY 1-HOUR PERIOD	1.0 MW/CM FOR OVER 1000 SEC.; 100 MW SEC/CM FOR PERIODS UNDER 1000 SEC.	SKIN AND EYE EFFECTS	
VANADIUM	AUGUST 23, 1977	VANADIUM PENTOXIDE (DUST): 0.5 MG/CU M CEILING; (FUME) 0.1 MG/CU M CEILING FERROVANADIUM: 1 MG/CU M, 8-HR TWA	VANADIUM COMPOUNDS: 0.05 MG/CU M CEILING (15-MINUTE); METALLIC VANADIUM AND VANADIUM CARBIDE: 1 MG/CU M TWA	EYE, SKIN, AND LUNG EFFECTS	PULMONARY FUNC-TION TESTING AND CHEST X-RAY REQUIRED
VINYL ACETATE	SEPTEMBER 7, 1978	NONE	15 MG/CU M (4-PPM) CEILING (15-MINUTE)	IRRITATION	
VINYL CHLORIDE	MARCH 11, 1974	1-PPM, 8-HR TWA; 5-PPM CEILING, (15-MINUTE SAMPLE)	MINIMUM DETECTABLE LEVEL; 1-PPM CEILING (2.55 MG/CU M) (15-MINUTE)	LIVER CANCER	STANDARD PROMULGATED OCTOBER 4, 1974 LIVER FUNCTION TESTING REQUIRED

NIOSH TWA RECOMMENDATIONS BASED ON UP TO A 10-HR EXPOSURE UNLESS OTHERWISE NOTED.

* RECOMMENDATION REVISED AS A PART OF NIOSH TESTIMONY AT OSHA HEARING

SUMMARY OF NIOSH RECOMMENDATIONS FOR OCCUPATIONAL HEALTH STANDARDS
OCTOBER, 1978

SUBSTANCE	TRANSMITTED TO OSHA	CURRENT OSHA ENVIRONMENTAL STANDARD	NIOSH RECOMMENDATION FOR ENVIRONMENTAL EXPOSURE LIMIT	HEALTH EFFECT CONSIDERED	COMMENTS
VINYL HALIDES	SEPTEMBER 12, 1978	1-PPM, 8-HR TWA; 5-PPM CEILING (15-MINUTE)	AS PROMULGATED FOR VINYL CHLORIDE IN 29 CFR 1910.1017 WITH EVENTUAL GOAL OF ZERO EXPOSURE	CANCER	DOCUMENT INCLUDES VINYL CHLORIDE, VINYLIDENE CHLORIDE, VINYL BROMIDE, VINYL FLUORIDE, AND VINYLIDENE FLUORIDE MONOMERS
WASTE ANESTHETIC GASES AND VAPORS	MARCH 4, 1977	NONE FOR SUBSTANCES WHEN USED AS ANESTHETIC AGENTS	2-PPM CEILING (HALOGENATED ANESTHETIC AGENTS) (1-HOUR); 25-PPM TWA DURING PERIODS OF USE (NITROUS OXIDE)	REPRODUCTIVE EFFECTS AND AUDIOVISUAL PERFORMANCE DECREMENTS	EMPLOYEES TO BE ADVISED OF POTENTIAL EFFECTS; ABNORMAL OUTCOME OF PREGNANCIES OF EMPLOYEES AND SPOUSE TO BE DOCUMENTED
XYLENE	MAY 23, 1975	100-PPM, 8-HR TWA	100-PPM TWA (434 MG/CU M); 200-PPM CEILING (868 MG/CU M) (10-MINUTE)	CENTRAL NERVOUS SYSTEM DEPRESSANT; AIRWAY IRRITATION	
ZINC OXIDE	OCTOBER 10, 1975	5 MG/CU M, 8-HR TWA	5 MG/CU M TWA, 15 MG/CU M CEILING (15-MINUTE)	METAL FUME FEVER	

NIOSH TWA RECOMMENDATIONS BASED ON UP TO A 10-HR EXPOSURE UNLESS OTHERWISE NOTED.

* RECOMMENDATION REVISED AS A PART OF NIOSH TESTIMONY AT OSHA HEARING

ORDERING INFORMATION FOR
Criteria for a Recommended Standard: Occupational Exposure to:

NIOSH PUB. NO.	TITLE	GPO STOCK NO.	PRICE	NTIS STOCK NO.	P/C PRICE	M/F P
76-195	ACETYLENE	017-033-00175-8	$1.55	PB267068	$6.00	$3.00
77-112	ACRYLAMIDE	017-033-00185-5	2.00	PB273871	7.25	3.00
78-116	ACRYLONITRILE	(NIOSH ONLY)	*	*	*	*
77-151	ALKANES	017-033-00213-4	2.75	PB273817	7.25	3.00
76-204	ALLYL CHLORIDE	017-033-00186-3	1.70	PB267071	6.00	3.00
74-136	AMMONIA	017-033-00036-1	1.55	PB246699	6.50	3.00
72-10267	ASBESTOS	017-033-00009-3	2.10	PB209510	7.25	3.00
77-169	ASBESTOS (REVISED)	017-033-00229-1	2.30	PB273965	6.00	3.00
78-106	ASPHALT FUMES	017-033-00272-0	3.25	PB277333	8.00	3.00
74-137	BENZENE	017-033-00038-7	2.10	PB246700	7.25	3.00
+	BENZENE (REVISED)	(NIOSH ONLY)	*	*	*	*
77-166	BENZOYL PEROXIDE	017-033-00221-5	2.75	PB273819	7.25	3.00
78-182	BENZYL CHLORIDE	017-033-00316-5	2.75	*	*	*
72-10268	BERYLLIUM	*	*	PB210806	7.25	3.00
77-122	BORON TRIFLUORIDE	017-033-00178-2	1.55	PB274747	6.00	3.00
76-192	CADMIUM	017-033-00206-1	2.30	PB274237	6.00	3.00
77-107	CARBARYL	017-033-00196-1	3.50	PB273801	9.25	3.00
78-204	CARBON BLACK	*	*	*	*	*
76-194	CARBON DIOXIDE	017-033-00199-5	3.25	PB266597	9.00	3.00
77-156	CARBON DISULFIDE	017-033-00216-9	3.25	PB274199	9.00	3.00
73-11000	CARBON MONOXIDE	*	*	PB212629	7.25	3.00
76-133	CARBON TETRACHLORIDE	*	*	PB250424	7.25	3.00
+	CARBON TETRACHLORIDE (REVISED)	(NIOSH ONLY)	*	*	*	*
76-170	CHLORINE	017-033-00176-6	2.40	PB266367	8.00	3.00
75-114	CHLOROFORM	*	*	PB246695	7.25	3.00
+	CHLOROFORM (REVISED)	(NIOSH ONLY)	*	*	*	*
77-210	CHLOROPRENE	017-033-00239-8	3.50	PB274777	9.00	3.00
73-11021	CHROMIC ACID	*	*	PB222221	6.50	3.00
76-129	CHROMIUM VI	*	*	PB248595	9.00	3.00
78-191	COAL GASIFICATION	*	*	*	*	*
76-107	COAL TAR PRODUCTS	017-033-00273-8	3.75	PB276917	9.00	3.00
73-11016	COKE OVEN EMISSIONS	*	*	PB216167	5.25	3.00
75-118	COTTON DUST	*	*	PB246696	8.00	3.00
78-133	CRESOL	017-033-00284-3	3.00	*	*	*
75-120	CRYSTALLINE SILICA	017-033-00050-6	1.95	PB246697	7.25	3.00
78-115	DIBROMOCHLOROPROPANE	(NIOSH ONLY)	*	*	*	*
78-215	DIISOCYANATES	*	*	*	*	*
78-131	DINITRO-ORTHO-CRESOL	(NIOSH ONLY)	*	*	*	*
77-226	DIOXANE	017-033-00254-1	4.00	*	*	*
76-128	EMERGENCY EGRESS	017-033-00124-3	1.25	PB248594	5.25	3.00
76-206	EPICHLOROHYDRIN	017-033-00197-9	2.30	*	*	*
77-221	ETHYLENE DIBROMIDE	017-033-00251-7	3.75	PB276621	9.25	3.00
76-139	ETHYLENE DICHLORIDE	017-033-00193-6	2.35	*	*	*
78-211	ETHYLENE DICHLORIDE (1,2 DICHLOROETHANE) (REVISED)	* (NIOSH ONLY)		*	*	*
77-152	FIBROUS GLASS	017-033-00214-2	3.50	PB274195	9.25	3.00
77-193	FLUOROCARBONS POLYMERS	017-033-00263-1	2.75	PB274727	6.50	3.00
77-126	FORMALDEHYDE	017-033-00190-1	2.40	PB273805	9.00	3.00
79-133	FURFURYL ALCOHOL	(NIOSH ONLY)	*	*		
78-166	GLYCIDYL ETHERS	017-033-00313-1	4.00	*	*	*
72-10269	HOT ENVIRONMENTS	017-033-00010-7	1.80	PB210794	6.50	3.00
78-172	HYDRAZINES	017-033-00310-6	4.75	*	*	*
77-108	HYDROGEN CYANIDE	017-033-00163-4	2.65	PB266230	9.25	3.00
76-143	HYDROGEN FLUORIDE	017-033-00171-5	2.50	*	*	*
77-158	HYDROGEN SULFIDE	017-033-00217-7	3.00	PB274196	8.00	3.00
78-155	HYDROQUINONE	017-033-00301-7	3.75	*	*	*
75-126	IDENTIFICATION SYSTEM	*	*	PB246698	5.25	3.00

74-110	INORGANIC ARSENIC	*	*	PB228151	6,50	3,00
75-149	INORGANIC ARSENIC (REVISED)	*	*	PB246701	7,25	3,00
76-103	INORGANIC FLUORIDE	017-033-00118-9	2,65	PB246692	9,00	3,00
73-11010	INORGANIC LEAD	*	*	PB214265	6,50	3,00
78-158	INORGANIC LEAD (REVISED)	017-033-00306-8	4,25	*	*	*
73-11024	INORGANIC MERCURY	*	*	PB222223	7,25	3,00
77-164	INORGANIC NICKEL	017-033-00219-3	4,25	PB274201	11,00	3,00
76-142	ISOPROPYL ALCOHOL	017-033-00165-1	1,95	PB273873	6,00	3,00
‡	KEPONE	(NIOSH ONLY)	*	*	*	*
78-173	KETONE	017-033-00315-7	4,50	*	*	*
76-188	LOGGING	*	*	PB266411	6,50	3,00
76-205	MALATHION	*	*	PB267070	9,00	3,00
78-174	MANUFACTURE & FORMULATION OF PESTICIDES	017-033-00314-9	6,25	*	*	*
76-148	METHYL ALCOHOL	017-033-00191-0	2,10	PB273806	6,00	3,00
77-106	METHYL PARATHION	017-033-00202-9	4,00	PB274191	9,00	3,00
76-138	METHYLENE CHLORIDE	017-033-00194-4	2,45	*	*	*
78-213	n-ALKANE MONO THIOLS CYCLOHEXANETHIOL, BENZENETHIOL	*	*	*	*	*
76-141	NITRIC ACID	017-033-00169-3	1,45	*	*	*
78-167	NITROGLYCERIN AND ETHYLENE GLYCOL DINITRATE	017-033-00311-4	4,25	*	*	*
73-11001	NOISE	*	*	PB213463	8,00	3,00
77-115	ORGANOTIN COMPOUNDS	017-033-00203-7	3,25	PB223113	9,00	3,00
76-149	OXIDES OF NITROGEN	(NIOSH ONLY)	*	*	*	*
76-190	PARATHION	017-033-00195-2	2,50	PB274192	6,50	3,00
76-196	PHENOL	017-033-00184-7	2,50	PB266495	9,00	3,00
76-137	PHOSGENE	017-033-00134-1	2,00	PB267514	7,25	3,00
77-225	POLYCHLORINATED BIPHENYLS	017-033-00265-7	4,00	PB276849	9,50	3,00
77-192	REFINED PETROLEUM	017-033-00234-7	4,00	*	*	*
76-105	SODIUM HYDROXIDE	017-033-00110-3	2,15	PB246694	6,00	3,00
74-128	SULFURIC ACID	017-033-00034-4	1,40	PB233098	6,00	3,00
74-111	SULFUR DIOXIDE	*	*	PB228152	6,50	3,00
77-121	1,1,2,2-TETRACHLOROETHANE	017-033-00179-1	2,20	PB273802	8,00	3,00
76-185	TETRACHLOROETHYLENE (PERC)	*	*	PB266583	8,00	3,00
78-179	o-TOLIDINE	*	*	*	*	*
73-11023	TOLUENE	*	*	PB222219	6,50	3,00
73-11022	TOLUENE DIISOCYANATE	*	*	PB222220	6,50	3,00
73-11025	TRICHLOROETHYLENE	*	*	PB222222	6,50	3,00
76-184	1,1,1-TRICHLOROETHANE (METHYL CHLOROFORM)	*	*	PB267069	9,00	3,00
77-227	TUNGSTEN AND CEMENTED TUNGSTEN CARBIDE	017-033-00268-1	3,50	PB275594	9,00	3,00
73-11009	ULTRAVIOLET RADIATION	*	*	PB214268	6,50	3,00
77-222	VANADIUM	017-033-00252-5	3,25	*	*	*
78-205	VINYL ACETATE	*	*	*	*	*
‡	VINYL CHLORIDE	(NIOSH ONLY)	*	*	*	*
77-140	WASTE ANESTHETIC GASES AND VAPORS	017-033-00204-5	3,50	PB274238	9,25	3,00
75-168	XYLENE	*	*	PB246702	6,50	3,00
76-104	ZINC OXIDE	017-033-00109-0	2,10	PB246693	6,00	3,00

* GPO and/or NTIS stock number and/or price not available.

‡ No NIOSH Publication Number is assigned.

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