

Appendix 23-2

OSHA Required Medical Surveillance and Recommended Testing

<u>Abbreviation</u>	<u>Meaning</u>	<u>Abbreviation</u>	<u>Meaning</u>
A	Annual Exam Requirement	GI	Gastrointestinal
ABD	Abdominal	Heme	Hematology
ABNL	Abnormal	Hx	History
AL	Action Level	Incl	Including
Addl	Additional	LFT	Liver Function Tests
Attn	Attention	Med	Medical
BUN	Blood Urea Nitrogen	SGOT(AST)	Aspartate aminotransferase
CAS	Chemical Abstract Service	SGPT(ALT)	Alanine aminotransferase
CBC	Complete Blood Count	SOB	Shortness of Breath
CNS	Central Nervous System	STEL	Short-term Exposure Limit
CVS	Cardiovascular System	Sys	System
Dis	Disease	T-Exp	Termination of Exposure
E-Exp	Emergency Exposure	T-Emp	Termination of Employment
Exp	Exposure	Y	Yes

**OSHA Regulated Toxic and Hazardous Substances**

<b>Chemical CAS# 29 CFR</b>	<b>Target Organs</b>	<b>Medical Surveillance Criteria</b>	<b>Exam Frequency</b>	<b>Required Medical History</b>	<b>Physical Exam (PE) Elements</b>	<b>Required Special Tests</b>	<b>Other Required Elements</b>
2-Acetylamino- fluorene CAS #53-96-3 1910.1014 (reference (q))	Lungs Liver Pancreas Kidneys Bladder Skin	Prior to assignment to enter a regulated area	Pre-A Y Per A E-Exp Y T-Exp N T- Emp N	Reduced immunity Smoking Hx Rx with steroids or cytotoxic drugs Current pregnancy (Self or spouse)	Content not specified in OSHA standard	Medical evaluation if respirator required (see reference (p))	Occupational Hx Family Hx of genetic disease Cancer Hx Addl risk-smoking Physician's Written Opinion required *
Acrylonitrile CAS #107-13-1 1910.1045 (reference (r))	CNS Resp GI Liver Skin	Exposure at or above the AL without regard to respirator use	Pre-A Y Per A E-Exp Y T-Exp N T-Emp Y *	Smoking Hx Lung/Resp disease Cough (dry/prod) Chronic abd pain Vomiting/Other GI symptoms Change in bowel movements Liver/Kidney disease Skin disease Headache/Neuro signs/symptoms *	Complete PE incl: * CNS PNS Resp Cardiovascular GI Skin Thyroid	Chest Xray (PA view only) GI tests incl fecal occult blood if age>40 Other tests as indicated * Med evaluation if respirator required (see reference (p))	Occupational Hx Addl risk-smoking Physicians Written Opinion required *
4-Aminodi- phenyl	Bladder Skin	Prior to assignment to	Pre-A Y Per A	Reduced immunity Smoking Hx	Content not specified in OSHA standard	Med evaluation if	Occupational Hx Family Hx of

**OSHA Regulated Toxic and Hazardous Substances**

CAS #92-67-1 1910.1011 (reference (s))		enter a regulated area	E-Exp Y T-Exp N T-Emp N	Rx with steroids or cytotoxic drugs Current pregnancy (Self or spouse)		respirator required (see ref. (p))	genetic diseases or cancer Addl risk-smoking Physician's Written Opinion required *
Arsenic-Inorganic CAS #7440-38-2 1910.1018 (reference (t))	Bladder Skin Lung	Exposure at or above the AL for more than 30 days per year without regard to respirator use*	Pre-A Y Per * E-Exp Y T-Exp Y T-Emp Y	Smoking Hx Lung/Resp disease Shortness of breath Cough (dry/prod)	Appropriate PE including: Nasal mucosa Skin Pulmonary	Chest Xray (PA view only)* GI tests incl fecal occult blood if age>40 Other tests as indicated *  Med evaluation if respirator required (see ref. (p))	Occupational Hx Addl risk-smoking Physician's Written Opinion required *
Asbestos CAS #1332-21-4 1910.1001 1915.1001 1926.1101  (references (h), (u), (v), (w))	Lungs Pleura	Use Appendices (AP1) & (AP2) of this Manual	Pre-A Y Per A E-Exp N T-Exp Y T-Emp Y*	Use Appendices (AP1) & (AP2) of this Manual - Asbestos Exposure Medical History forms	Complete PE with emphasis on: Pulmonary Cardiovascular GI	PFT CXR See Appendix E of reference (h)	Occupational Hx Addl risk of asbestos exposure & smoking Physician's Written Opinion required *  (Use Appendix AP3 of this Manual)
Benzene CAS #71-43-2 1910.1028 (reference (x))	Eyes Resp Sys CNS Skin	Employees exposed: 1) at or above AL 30 days/year	Pre-A Y Per A E-Exp Y T-Exp N	Current medications Blood diseases Liver disease Kidney disease	Initial: Complete PE Periodic: every 3 years (if respirator used >30 days/year)	CBC PFT (every 3 years if required to	Occupational Hx Past Hx of benzene exposure/ heme toxins

**OSHA Regulated Toxic and Hazardous Substances**

	Blood/Bone marrow	2) at or above PEL 10 days/year 3) at or above 10 PPM 30 days/year prior to 1987 4) to >0.1% benzene solvent as tire building machine operators	T-Emp N	Ionizing radiation exposure Cancer (incl leukemia)	specific attention to: cardiopulmonary exam) *	use a respirator >30 days/year) See 29 CFR 1910.1028 (reference (x)) for interpretation of CBC results & emergency exposure labs	Family Hx of blood dyscrasias Addl risk-smoking Physician's Written Opinion required * Medical referral required*
Benzidine CAS #92-87-5 1910.1010 (reference (y))	Liver Kidneys Bladder Skin Blood	Prior to assignment to enter a regulated area	Pre-A Y Per A E-Exp Y T-Exp N T-Emp N	Reduced immunity Smoking Hx Rx with steroids or cytotoxic drugs Current pregnancy (Self or spouse)	Content not specified in OSHA standard	Med evaluation if respirator required (see ref. (p))	Occupational Hx Family Hx of genetic diseases or cancer Addl risk-smoking Physician's Written Opinion required *
1,3 Butadiene CAS #106-99-0 1910.1051 (reference (z))	Eyes Respiratory CNS Blood	Before the time of initial assignment	Pre-A Y Per * E-Exp Y T-Exp * T-Emp *	Comprehensive health hx with annual update Blood diseases See Appendix C of OSHA Standard for questionnaire sample content *	Complete PE with special emphasis on:  Liver Spleen Lymph nodes Skin	CBC Addl test as necessary	Occupational Hx Past exposure to chemical or other blood toxins Written Medical Opinion required * Consultation as needed *
Cadmium CAS #7440-43-9 CAS #1306-19-0 1910.1027 (reference (aa))	Resp Sys Kidneys Prostate Blood	Employees who are or may be exposed: 1) at or above AL 30 days/ year	Pre-A Y Per * E-Exp Y T-Exp N T-Emp N	Detailed work & medical Hx with emphasis on: Cadmium Exp Smoking Hx/status	Complete PE with emphasis on: Blood pressure Resp system Urinary system	PFT CXR (PA only) CBC BUN/	Medical Removal Assessment* Addl risk-smoking Physician's Written Opinion

**OSHA Regulated Toxic and Hazardous Substances**

		2) previous exposure above AL total of 60 months		Reproductive status Medications (nephrotoxins) Dysfunction of: Cardiovascular Sys Respiratory system Renal system Heme system Musculo-skeletal Sys	Prostate exam Males > 40yrs	Creatinine Blood cadmium Urinalysis Urine cadmium Urine beta-2 microglobulin Respirator certification if required (see ref (p)) (A urine creatinine is also needed for interpretation of required tests.)	required *
Bis-Chloro-Methylether CAS #542-88-1 1910.1008 (reference (bb))	Eyes Lungs Skin	Prior to assignment to enter a regulated area	Pre-A Y Per A E-Exp Y T-Exp N T-Emp N	Reduced immunity Smoking Hx Rx with steroids or cytotoxic drugs Current pregnancy (Self or spouse)	Content not specified in OSHA standard	Med evaluation if respirator required (see ref. (p))	Occupational Hx Family Hx of genetic diseases or cancer Addl risk-smoking Physician's Written Opinion required *
Coke Oven Emmissions 1910.1029 (reference (cc)) (Also see Coal Tar Pitch	Lungs Kidneys Bladder Skin	Employed in a regulated area 30 or more days/year	Pre-A Y Per A E-Exp Y T-Exp Y * T-Emp Y *	Smoking Hx Lung/Resp disease Shortness of breath Cough (dry/prod)	Weight Skin Pulmonary	CXR * (PA view only) PFT Urinalysis Urine & Sputum	Occupational Hx Addl risk-smoking Physician's Written Opinion required *

**OSHA Regulated Toxic and Hazardous Substances**

Volatiles; 1910.1002 (reference (dd))						cytology Med evaluation if respirator required (see ref. (p))	
1,2-Dibromo-3- Chloropropane CAS #107-13-1 1910.1044 (reference (ee))	CNS Eyes Lungs Liver/GI Spleen Kidneys Repro Skin	Employed in a regulated area and emergency exposures	Pre-A Y Per A E-Exp Y * T-Exp N T-Emp N	Impotence or sexual dysfunction Infertility or miscarriage (Self or spouse) Current pregnancy (Self or spouse)	Body habitus Genito-urinary (including testicle size)	Serum tests: Estrogen (Females only) Follicle Stimulating Hormone Luteinizing Hormone Sperm Count * (Males only)	Occupational Hx Physician's Written Opinion required *
3,3'-Dichloro- Benzidine CAS #91-94-1 1910.1007 (reference (ff))	Lungs Liver/GI Bladder Skin	Prior to assignment to enter a regulated area	Pre-A Y Per A E-Exp Y T-Exp N T-Emp N	Reduced immunity Smoking Hx Rx with steroids or cytotoxic drugs Current pregnancy (Self or spouse)	Content not specified in OSHA standard	Med evaluation if respirator required (see ref. (p))	Occupational Hx Family Hx of- cancer or genetic diseases Environmental Hx Addl risk-smoking Physician's Written Opinion required *
3,3'-Dichloro- Benzidine CAS #91-94-1 1910.1007 (reference (ff))	Lungs Liver/GI Bladder Skin	Prior to assignment to enter a regulated area	Pre-A Y Per A E-Exp Y T-Exp N T-Emp N	Reduced immunity Smoking Hx Rx with steroids or cytotoxic drugs Current pregnancy (Self or spouse)	Content not specified in OSHA standard	Med evaluation if respirator required (see ref. (p))	Occupational Hx Family Hx of- cancer or genetic diseases Environmental Hx Addl risk-smoking

**OSHA Regulated Toxic and Hazardous Substances**

							Physician's Written Opinion required *
4-Dimethyl- aminoazo- benzene CAS #60-11-7 1910.1015 (reference (gg))	Lungs Liver Kidneys Bladder Skin	Prior to assignment to enter a regulated area	Pre-A Y Per A E-Exp Y T-Exp N T-Emp N	Reduced immunity Smoking Hx Rx with steroids or cytotoxic drugs Current pregnancy (Self or spouse)	Content not specified in OSHA standard	Med evaluation if respirator required (see ref. (p))	Occupational Hx Family Hx of cancer or genetic diseases Environmental Hx Addl risk-smoking Physician's Written Opinion required *
Ethyleneimine CAS #151-56-4 1910.1012 (reference (hh))	Eyes Lungs Liver Kidneys Skin	Prior to assignment to enter a regulated area	Pre-A Y Per A E-Exp Y T-Exp N T-Emp N	Reduced immunity Smoking Hx Rx with steroids or cytotoxic drugs Current pregnancy (Self or spouse)	Content not specified in OSHA standard	Med evaluation if respirator required (see ref. (p))	Occupational Hx Family Hx of cancer or genetic diseases Environmental Hx Addl risk-smoking Physician's Written Opinion required *
Ethylene Oxide CAS #75-21-8 1910.1047 (reference (ii))	Eye GI Resp Blood Repro CNS	For all employees who or may be exposed at or above AL > 30 days/year	Pre-A Y Per A E-Exp Y T-Exp Y T-Emp Y	Work Hx with emphasis on: Eyes Skin Following systems: Pulmonary Hematologic Reproductive Neurologic	PE with emphasis on: Eyes Skin Following systems: Pulmonary Hematologic Reproductive Neurologic	CBC with differential Pregnancy/ fertility testing if indicated Med evaluation if respirator required  (see ref. (p))	Occupational Hx Addl risk-smoking Physician's Written Opinion required *

**OSHA Regulated Toxic and Hazardous Substances**

<p>Formaldehyde CAS #50-00-0 1910.1048 (reference (jj))</p>	<p>Eyes Resp Skin</p>	<p>All employees exposed at or above AL or exceeding the STEL.</p>	<p>Pre-A Y Per A E-Exp Y T-Exp N T-Emp N</p>	<p>Smoking Hx Eye/Nose/Throat irritation Chronic airway problems Hyperactive airway disease Allergic skin conditions Dermatitis Upper/Lower resp problems See OSHA non-mandatory questionnaire *</p>	<p>PE with emphasis on: Eye irritation Irritation / sensitization of skin or respiratory system Shortness of breath</p>	<p>PFT - every year (if using a respirator) * Med evaluation if respirator required (see ref. (p))</p>	<p>Medical removal assessment Occupational Hx Family Hx of blood, genetic diseases or cancer Addl risk-smoking Physician's Written Opinion required *</p>
<p>Lead CAS #74-39-1 1910.1025, General Industry (reference (kk)) 1926.62 Lead in Construction (reference (ll))</p>	<p>Gingiva GI Kidney CNS PNS Repro Sys Blood/ Bone marrow</p>	<p>Employees who are or may be exposed above the AL for 30 days/year</p>	<p>Pre-A Y Per * E-Exp Y* T-Exp N T-Emp N See Figure 2-1 of this Manual</p>	<p>Detailed medical &amp; work Hx with emphasis on: Past lead exp - Occupational - Non-occupational Personal habits - Smoking - Hygiene Past Problems: - GI - Renal - Reproductive Sys - Neuro system - Heme system</p>	<p>Thorough PE with particular attn to: Teeth Gums Cardiovascular Neuro Heme system Blood pressure Pulmonary system if resp protection</p>	<p>Blood lead CBC with peripheral smear morphology Zinc Proto-porphyrin BUN Creatinine Urinalysis with microscopic Med evaluation if respirator required (see ref. (p))</p>	<p>Medical Removal Assessment* Occupational Hx Addl risk-smoking Other tests deemed reasonable by examining physician Physician's Written Opinion required *</p>
<p>Lead CAS #74-39-1</p>	<p>Gingiva GI</p>	<p>Employees who are or may be</p>	<p>Pre-A Y Per *</p>	<p>Detailed medical &amp; work Hx with</p>	<p>Thorough PE with particular attn to:</p>	<p>Blood lead CBC with</p>	<p>Medical Removal Assessment*</p>



**OSHA Regulated Toxic and Hazardous Substances**

<p>1910. 1025, General Industry (reference (kk)) 1926.62 Lead in Construction (reference (ll))</p>	<p>Kidney CNS PNS Repro Sys Blood/ Bone marrow</p>	<p>exposed above the AL for 30 days/year</p>	<p>E-Exp Y* T-Exp N T-Emp N See Figure 2-1 of this Manual</p>	<p>emphasis on: Past lead exp - Occupational - Non-occupational Personal habits - Smoking - Hygiene Past Problems: - GI - Renal - Reproductive Sys - Neuro system - Heme system</p>	<p>Teeth Gums Cardiovascular Neuro Heme system Blood pressure Pulmonary system if resp protection</p>	<p>peripheral smear morphology Zinc Proto- porphyrin BUN Creatinine Urinalysis with microscopic Med evaluation if respirator required (see ref. (p))</p>	<p>Occupational Hx Addl risk-smoking Other tests deemed reasonable by examining physician Physician's Written Opinion required *</p>
<p>Methylene- dianiline  CAS #101-77-9  1910.1050  (reference (mm))</p>	<p>Liver  Skin</p>	<p>Before the time of initial assignment</p>	<p>Pre-A Y  Per A  E-Exp Y  T-Exp N  T-Emp N</p>	<p>Detailed Hx  Medications  Alcohol use  Tobacco use  Hx of dermatitis  Hx of liver disease</p>	<p>Routine PE including:  Signs of liver disease  Skin</p>	<p>LFTs  Urinalysis  Addl test  as required</p>	<p>Occupational Hx  Past exp to chemical or other toxic substances  Chemical skin sensitization  Consultation as needed  Medical Written Opinion required *  Multiple Physician  Review Mechanism</p>
<p>Methyl chloromethyl ether  CAS #107-30-2</p>	<p>Eyes  Lungs Skin</p>	<p>Prior to assignment to enter a regulated area</p>	<p>Pre-A Y  Per A  E-Exp Y</p>	<p>Reduced immunity  Smoking Hx  Rx with steroids or</p>	<p>Content not specified in  OSHA standard</p>	<p>Med evaluation if respirator required  (see ref. (p))</p>	<p>Occupational Hx  Family Hx of cancer or genetic diseases</p>

**OSHA Regulated Toxic and Hazardous Substances**

1910.1006 (reference (nn))			T-Exp N T-Emp N	cytotoxic drugs Current pregnancy (Self or spouse)			Environmental Hx Addl risk-smoking Physician's Written Opinion required *
Methylene chloride CAS# 75-09-2 1910.1052 (reference (oo))	Eyes CVS CNS Skin	Before the time of initial assignment	Pre-A Y Per * E-Exp Y T-Exp * T-Emp *	Comprehensive Medical Hx: Neurological Symptoms Heart Disease Liver Disease Blood Disease See Appendix B of OSHA Standard for questionnaire sample content *	Particular attn to: Lungs Cardiovascular Sys Liver Neuro Sys Skin	Based on Medical & Work Hx Observed health status See Appendix B of OSHA Standard for further information *	Occupational Hx including: Personal Protective Equipment; Past Exp to chemical; Work practices. Written Medical Opinion required *
Methylene chloride CAS# 75-09-2 1910.1052 (reference (oo))	Eyes CVS CNS Skin	Before the time of initial assignment	Pre-A Y Per * E-Exp Y T-Exp * T-Emp *	Comprehensive Medical Hx: Neurological Symptoms Heart Disease Liver Disease Blood Disease See Appendix B of OSHA Standard for questionnaire sample content *	Particular attn to: Lungs Cardiovascular Sys Liver Neuro Sys Skin	Based on Medical & Work Hx Observed health status See Appendix B of OSHA Standard for further information *	Occupational Hx including: Personal Protective Equipment; Past Exp to chemical; Work practices. Written Medical Opinion required *
Alpha-	Bladder	Prior to assignment	Pre-A Y	Reduced immunity	Content not specified	Med evaluation if	Occupational Hx

**OSHA Regulated Toxic and Hazardous Substances**

Naphthylamine CAS #134-32-7 1910.1004 (reference (pp))	Skin	to enter a regulated area	Per A E-Exp Y T-Exp N T-Emp N	Smoking Hx Rx with steroids or cytotoxic drugs Current pregnancy (Self or spouse)	in OSHA standard	respirator required  (see ref. (p))	Family Hx of cancer or genetic diseases Environmental Hx Addl risk-smoking Physician's Written Opinion required *
Beta-Naphthylamine CAS # 91-59-8 1910.1009 (reference (qq))	Bladder Skin	Prior to assignment to enter a regulated area	Pre-A Y Per A E-Exp Y T-Exp N T-Emp N	Reduced immunity Smoking Hx Rx with steroids or cytotoxic drugs Current pregnancy (Self or spouse)	Content not specified in OSHA standard	Med evaluation if respirator required  (see ref. (p))	Occupational Hx Family Hx of cancer or genetic diseases Environmental Hx Addl risk-smoking Physician's Written Opinion required *
4-Nitrobiphenyl CAS #92-93-3 1910.1003 (reference (rr))	Bladder Blood	Prior to assignment to enter a regulated area	Pre-A Y Per A E-Exp Y T-Exp N T-Emp N	Reduced immunity Smoking Hx Rx with steroids or cytotoxic drugs Current pregnancy (Self or spouse)	Content not specified in OSHA standard	Med evaluation if respirator required  (see ref. (p))	Occupational Hx Family Hx of cancer or genetic diseases Environmental Hx Addl risk-smoking Physician's Written Opinion required *
N-Nitroso-	Nose	Prior to assignment	Pre-A Y	Reduced immunity	Content not	Med evaluation if	Occupational Hx

**OSHA Regulated Toxic and Hazardous Substances**

<p>dimethylamine CAS #62-75-9 1910.1016 (reference (ss))</p>	<p>Lungs Liver Kidneys</p>	<p>to enter a regulated area</p>	<p>Per A E-Exp Y T-Exp N T-Emp N</p>	<p>Smoking Hx Rx with steroids or cytotoxic drugs Current pregnancy (Self or spouse)</p>	<p>specified in OSHA standard</p>	<p>respirator required (see ref. (p))</p>	<p>Family Hx of cancer or genetic diseases Environmental Hx Addl risk-smoking Physician's Written Opinion required *</p>
<p>Beta-Propio-lactone CAS #57-57-8 1910.1013 (reference (tt))</p>	<p>Eyes Lungs Liver Kidney Skin</p>	<p>Prior to assignment to enter a regulated area</p>	<p>Pre-A Y Per A E-Exp Y T-Exp N T-Emp N</p>	<p>Reduced immunity Smoking Hx Rx with steroids or cytotoxic drugs Current pregnancy (Self or spouse)</p>	<p>Content not specified in OSHA standard</p>	<p>Med evaluation if respirator required (see ref. (p))</p>	<p>Occupational Hx Family Hx of cancer or genetic diseases Environmental Hx Addl risk-smoking Physician's Written Opinion required *</p>
<p>Chromic Acid CAS #1333-82-0 CAS #7738-94-5 1910.94(d)(9) (viii) (Ventilation, reference (uu))</p>	<p>Eyes Skin (Other systems in ref (i) Lungs, Liver, Kidneys Blood)</p>	<p>Workers exposed to chromic acids  (Note: Briefly mentioned in OSHA Ventilation standard and regards only nose and skin exposure to chrome fumes)</p>	<p>Pre-A N Per * E-Exp N T-Exp Y T-Emp N</p>	<p>Hx of ulceration in nose or other parts of body</p>	<p>Nostrils &amp; other parts of body to detect ulceration</p>	<p>Med evaluation if respirator required (see ref. (p))</p>	<p>Occupational Hx Addl risk-smoking</p>
<p>Vinyl Chloride</p>	<p>CNS</p>	<p>Exposure at or</p>	<p>Pre-A Y</p>	<p>Alcohol intake</p>	<p>General PE with</p>	<p>SGOT (AST)</p>	<p>Medical history*</p>

**OSHA Regulated Toxic and Hazardous Substances**

CAS #75-01-4 1910.1017 (reference (vv))	PNS Lungs Liver Blood Lymph System	above the AL without regard to respirator use.	Per * E-Exp N T-Exp N T-Emp N	Hepatitis Hx Work Hx hepatotoxins/ chemicals Blood transfusion Hx Hospitalizations	attention to: * Lungs Liver Spleen Kidneys Connective tissues Skin	SGPT (ALT) Total bilirubin Alkaline phosphatase Gamma glutamyl transpep- tidase (GGT) Repeat Abnl tests ASAP (within 3-4 wks) *	Removal from exposure if lab tests abnormal * Physician's Written Opinion required *
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