PLAINTIFF'S EXHIBIT

UC-5000

OSHA Compliance Checklist

Produced by the editors of ADHESIVES AGE
and presented through the courtesy of
Union Carbide Corporation



DECEMBER 1976

THE WILDEST DREAMS HAVE A WAY OF COMING TRUE.

Just a reminder that planning for tomorrow's possibilities is not only a very important but also a very exciting part of today's work.

That's why we are developing unique products for water-borne, hot melts, and other new adhesive and sealant technologies.

And why we have an entire department dedicated to serving nearly every segment of your industry.

It's why we're maintaining our position as a leading supplier of oxygenated solvents.

And at the same time helping our customers reformulate to meet both short- and long-term pollution control standards.

Our research and development teams are dedicated to developing a wide variety of products, applications and techniques to meet a broader range of customer needs and expectations.

And we're expanding our ability to distribute efficiently as well as provide prompt and personal technical service. We already have five full-service regional latex plants. Soon there'll be more.

You see, we expect the future to be full of surprises for some people. And filled with opportunities for others.

PEOPLE PLANNING THE FUTURE.

UNION CARBIDE

Adhesive and Sealant Intermediates

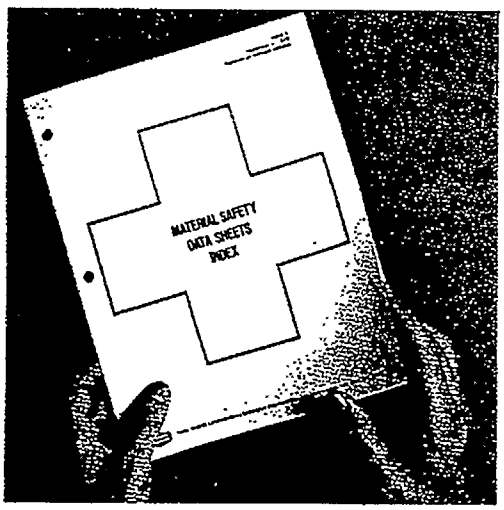
KMSB 6639

Union Carbide Material Safety Data Sheets For The Adhesives Industry

The complete Index of MSD Sheets can be obtained from your Union Carbide representative.

Material	Form Number
Acetone	F-43002
Acetophenone	F-43358
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ANHYDROL Solvent, PM 1474 [A.T.F.D. Special Industrial Solvent Formula A]	F-43060
ANHYDROL Solvent Special, PM 4080	F-43867
ANHYDROL Solvent, PM 4081 [A.T.F.D. Special Industrial Solvent Formula A]	F-43197
ANHYDROL Solvent Special, Anhydrous, PM 4082	F-44079
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ANHYDROL Solvent, PM 4084 [A.T.F.D. Special Industrial Solvent Formula A]	F-43198
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ANHYDROL Solvent Special 190, PM 4078 (Government Formulation DM)	F-44334
ANHYDROL Solvent Special 190, PM 4079 (Government Formulation AM)	F-44115
Benzene	F-43095
Bisphenol A, UCAR	F-43571
1,3-Butadiene	F-43120
Butanol	F-43024
2-Butanol	F-43572
Butyl Acetate	F-43019
Butyl Acetate Mixture, PM 5131	F-43305
Butyl Acrylate	F-43073
Butyl CARBITOL	F-43017
Butyl CARBITOL Acetate	F-43074
Butyl CELLOSOLVE	F-43003
Butyl CELLOSOLVE Acetate	F-43282
CARBITOL Acetate	F-43026
CARBITOL Mixture, PM 3949	F-44381
CARBITOL Solvent	F-43018
CARBITOL Solvent, PM 600	F-45879

Material	Form Number
CARBOWAX Methoxy Polyethylene Glycol 350	F-43443
CARBOWAX Methoxy Polyethylene Glycol 550	F-43444
CARBOWAX Methoxy Polyethylene Glycol 750	F-43445

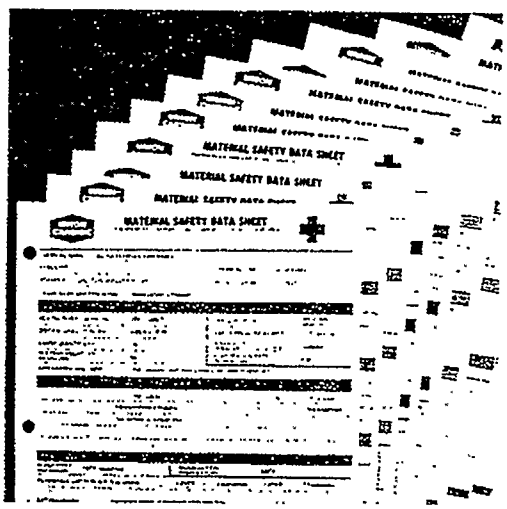


CARBOWAX	Polyethylene	Glycol	200	F-43359
CARBOWAX	Polyethylene	Glycol	300	F-43436
CARBOWAX	Polyethylene	Glycol	400	F-43430
CARBOWAX	Polyethylene	Glycol	600	F-43437
CARBOWAX	Polyethylene	Glycol	1,000	F-43438
CARBOWAX	Polyethylene	Glycol	1,500	F-43439
CARBOWAX	Polyethylene	Glycol	1,540	F-43440
CARBOWAX	Polyethylene	Glycol	4,000	F-43441
CARBOWAX	Polyethylene	Glycol	6,000	F-43446
CARBOWAX	Polyethylene	Glycol	20,000	F-43442

KMBS 6641

Material	Form Number
CELLOSIZE Hydroxyethyl Cellulose QP-Grades, General	F-43837
CELLOSIZE Hydroxyethyl Cellulose WP-Grades, General	F-43836
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CELLOSOLVE Solvent	F-43023
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Iso-Decyl Acrylate	F-43221
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2,2-Diethoxyacetophenone	F-45711
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Diethylene Glycol	F-43105
Diethylenetriamine	F-43123
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EVA-501 Resin, BAKELITE Co-MER	F-43647
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EVA-506 Resin, BAKELITE Co-MER	F-44095
EVA-507 Resin, BAKELITE Co-MER	F-46056
EVA-508 Resin, BAKELITE Co-MER	F-43649
EVA-605 Resin, BAKELITE Co-MER	F-44096
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Epoxy Hardener ZZL-0334, BAKELITE Liquid	F-43656
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Epoxy Hardener ZZL-0846, BAKELITE Liquid	F-43668
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Epoxy Hardener ZZLB-0822, BAKELITE Liquid	F-43664
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Material	Form Number
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Ethanol (see also ANHYDROL and SYNASOL Solvents)	
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Ethanol, CD-19, 190 proof	F-43412
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Ethanol, SD-40, 200 proof	F-44749
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Ethyl Acetate, 85-88%, Denatured	F-43199
Ethyl Acrylate	F-43126
Ethylenediamine	F-43127
Ethylene Glycol	F-43022
Ethylene Oxide	F-43130
2-Ethylhexyl Acrylate, Inhibited	F-43586
Ethylidenenorbornene	F-43429



Glutaraldehyde, 25% Aqueous Solution	F-43549
Glyoxal, 40% Aqueous Solution	F-43447
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Material	Form Number
Methanol	F-43112
Methyl Amyl Acetate	F-43114
Methyl Amyl Acetate Mixture, PM 4433	F-43259
Methyl Amyl Alcohol	F-43115
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Methyl CARBITOL	F-43025
Methyl CELLOSOLVE	F-43201
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Phenolic Baking Resin BKS-2315, BAKELITE	F-44077
Phenolic Baking Resin BKS-2710, BAKELITE	F-43816
Phenolic Resin Solution BLS-2700, BAKELITE	F-43957
Phenolic Resin BRP-8152, BAKELITE	F-44154
Phenolic Resin BRPA-4494, BAKELITE	F-45883
Phenolic Resin CK-1634, BAKELITE Oil-Soluble, Heat-Reactive, 100%	F-44436
Phenolic Resin CK-0405, BAKELITE Oil-Soluble, Non-Heat-Reactive	F-43325
Phenolic Resin CK-2103, BAKELITE Oil-Soluble, Non-Heat-Reactive	F-43245
Phenolic Resin CK-2432, BAKELITE Oil-Soluble, Non-Heat-Reactive	F-43326
Phenolic Resin CK-5254, BAKELITE Oil-Soluble, Non-Heat-Reactive	F-43327
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Phenolic Dispersion Resin CKU-5960, BAKELITE	F-43161
Phenoxy Resin PKHA, PKHC, PKHH, BAKELITE	F-43276
Phenyl Acetate	F-44131
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Plasticizer EPO, FLEXOL	F-43361
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Polyol LHT-Series, General, NIAX	F-43999
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Vinyl Acetate Resins, General, BAKELITE	F-43914
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Vinyl Resin VMCH, BAKELITE	F-43157
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Vinyl Resin VYNC, BAKELITE	F-44054
Vinyl Resin VYNS, BAKELITE	F-43154
Vinyl Resin VYNW, BAKELITE	F-43155
Vinyl Resin Coating Solution VYDS, BAKELITE	F-43040

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KM66641



Robert W. Wesson
Vice-President and General Manager
Coatings and Adhesives Materials Dept.
Union Carbide Corporation

IT is a privilege for Union Carbide to cooperate with ADHESIVES AGE in publishing this OSHA checklist.

OSHA has come a long way in a short time. The OSHA standards are now very sophisticated. But in their very sophistication lies a serious paradox — the difficulty of unraveling all the new regulations, and then following them.

We at Union Carbide hope the accompanying checklist, summarizing the OSHA regulations, will be of value to harried adhesives manufacturing people.

The checklist provides a way to follow OSHA standards, and that is important because the standards have become extremely comprehensive and we are all obliged to follow them.

Of course, regulations alone don't make a safe plant. Effective safety programs are needed to ensure that accidents in the workplace are held to a minimum. Employees at every level must be conscious of good safety practice. Union Carbide has long had many committees and groups, at various levels, working in the health and safety area. Recently, Union Carbide established a new corporate department called the Health, Safety and Environmental Affairs Department.

The new department will develop an advanced corporate epidemiological program, computerize industrial hygiene and health records, monitor the worldwide environmental impact analysis system, ensure adherence to medical standards, and develop new corporate systems dealing with product safety. Data generated by this department will be made available to our distributors and customers, and to anyone in the adhesives industry who might benefit from it.

Union Carbide's emphasis on safety has paid off in the past. For example, the number of our disabling injuries is now less than one-quarter the industrial average. Our Chemicals & Plastics group rating — which includes the Coatings and Adhesives Materials Department — is actually six times better than the average.

Sound safety practices and good business go hand in hand. And like other companies, we take many approaches to attack safety problems. If someone has a better way to protect people — whether it is OSHA, a competitor or an employee — we will incorporate the improvement into our operations.

We at Union Carbide seek out every opportunity to cooperate with government and industry so that we can all be safer. I recently gave a talk entitled "Beyond Safety Regulations," in which I pointed out how we worked closely with OSHA in providing safety information. I thought you might like to read some of the highlights: they are reproduced on the following pages.

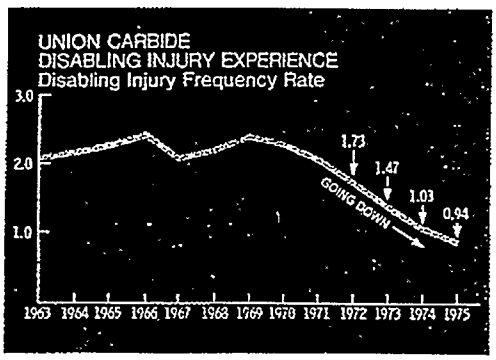
KMSS 664:

Beyond Safety Regulations

BY ROBERT W. WESSON

THOUGH many company records, including Union Carbide's, show that employees are safer at work than at home, as long as lives and limbs are being lost in the plant, industry cannot rest on its excellent safety records or regulations.

At Union Carbide, improving safety is a goal that everyone is constantly striving to achieve.



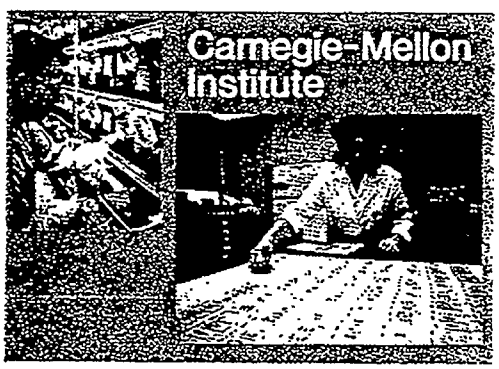
It is a way of life that begins with upper management. In addition to a corporate safety department and its committees, each division or operating unit of the Corporation has a safety and health organization devoted to its own particular needs. The Chemicals & Plastics people organized a group known as SHARE, which falls under the direction of a vice-president. The name is derived from safety, health and affairs related to the environment. SHARE further ensures that Union Carbide's Chemicals & Plastics operations meet all aspects of the Federal Occupational Safety and Health Act.

Union Carbide is extremely cautious with newly developed chemicals and resins. Before manufacture or use in plants, new substances are rated for their toxicological properties. Much of this work is done at the Carnegie-Mellon Institute of Research in Pittsburgh, Penna.

Union Carbide has long benefited from the services of this toxicology research laboratory. It was nearly 40 years ago that Union Carbide established its Chemical Hygiene Fellowship at the Mellon Institute. This was a full year before the enactment of the Food, Drug and Cosmetic Act, which required testing of food additives and other products that might be harmful.

4,000 Compounds Tested

During the ensuing four decades, the Fellowship has grown from a two-man operation to a staff of over 35. To date, over 4,000 compounds have been assayed to delineate



their toxicological properties. Each chemical is examined to answer the following:

Under what conditions can the compound be manufactured without injury to plant personnel? Can it be shipped without special han-

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dling procedures? If not, what procedure must be employed? And, *under what conditions can it be used safely by the public?*

Safety programs for the industry at large are, of course, as vital as the Corporation's internal programs. For example, results of the work done at Carnegie-Mellon by the Chemical Hygiene Fellowship are made available to the scientific community through publication and sharing of information. Product literature routinely includes precautionary labeling information, toxicological properties, FDA and EPA status where applicable, and special handling procedures when necessary.

Development of MSD Sheets

Another advance of which Union Carbide is proud is the development of its Material Safety Data (MSD) Program — perhaps the largest single endeavor undertaken to provide our customers and our customers' customers with pertinent safety data.

In 1970, the Department of Labor mandated that MSD sheets be issued on all hazardous products sold to the ship repairing, shipbuilding and shipbreaking industries (the so-called 3-S industries). These sheets were to be retained at the job site by those using the products. While safety data have always been published on Union Carbide's products, these new requirements were more detailed and were specific to these three industries.

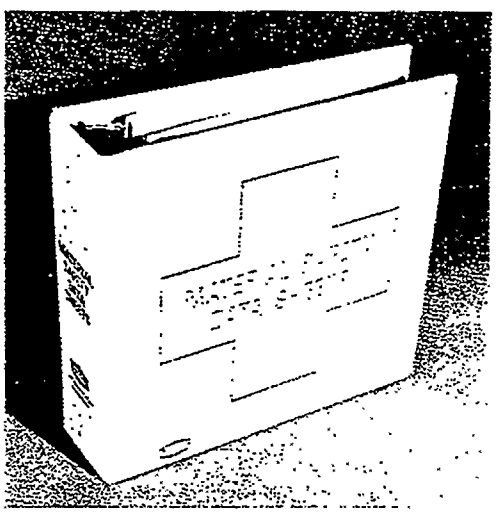
Beyond Government Programs

The first Department of Labor MSD regulation came out on July 1, 1970. Union Carbide meanwhile had outdistanced the government program both in time and in scope. By that time, the company had already devised its own modified MSD sheets — actually more comprehensive than required — which the Department of Labor approved on June 20, 1970. Union Carbide's first MSD sheet was issued a few months later. Since that time, over 600 sheets have been issued covering an enormous variety of products going into many different industries. Eventually, an MSD sheet will be issued on every product produced — even on those not officially considered hazardous. This program is much too valuable to limit its use to the legal requirements of the mandate.

When a request is made for a new MSD sheet by customers, distributors or internally, a team of experts, from chemists to lawyers, collaborates on developing a sheet that is as clear and helpful as possible. These sheets are so carefully done — so comprehensive and clear — that many other companies, and even OSHA, use them as models.

To gather the physical data, Union Carbide's labs do extensive testing in areas such as hazardous ingredients, fire and explosion, health, reactivity, spill or leak procedures, special protection and special precautions. As a result, much more is included in the data sheets than is required by current OSHA regulations. On each data sheet a list of phone numbers is included so that Union Carbide safety experts can provide assistance at any time, day or night.

Not only is a major effort made to prepare the sheets, but also to have them widely distrib-



uted and used. Customers are encouraged, via direct contact, newsletters, seminars, etc., to ask for the sheets. They can be obtained either through Union Carbide's sales force or distributors. Special binders are provided for convenient filing and efficient retrieval of information.

A comprehensive index, which lists all sheets issued to date, is also provided for ready reference. Holders of MSD binders automatically receive an updated index as soon as it is issued. And, of course, all MSD sheets are systematically reviewed for updating and/or revisions.

The MSD Program is only one of many recent efforts to make industry safer. Union Carbide is dedicated to the continued upgrading of all safety programs. Our lives depend on it.

KM66 6641

adhesives age
MANUFACTURE APPLICATION TECHNOLOGY RESEARCH AND MARKETING
DECEMBER 1976

re Limits mg./M³	Substance	Exposure Limits p.p.m.[a]	mg./M³[b]
—	Uranium (soluble compounds)	—	0.05
5	Uranium (insoluble compounds)	—	0.25
15	C Vanadium:		
0.4	V_2O_5 dust	—	0.5
1.5	V_2O_5 fume	—	0.1
	Vinyl benzene, see Styrene	—	—
0.1	Vinylcyanide, see Acrylonitrile	—	—
0.001	Vinyl toluene	100	480
10	Warfarin	—	0.1
5	Xylene (xylol)	100	435
0.2	Xylidine — Skin	5	25
0.4	Yttrium	—	1
	Zinc chloride fume	—	1
0.01	Zinc oxide fume	—	5
	Zirconium compounds (as Zr)	—	5
0.05			
2			
0.5			
350			
0.15			
13			
6,000			
1			
6			
0.25			
20			
—			
10			
5			
0.2			
0.1			
0.2			
0.05			
9			
4,170			
4,170			
35			
—			
—			
2			
0.075			
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0.07			
3			
8			
1.5			
0.1			
5			
2			
[illegible]			
[illegible]			
22			
—			
5			
—			
[illegible]			
[illegible]			
—			

[a]Parts of vapor or gas per million parts of contaminated air by volume at 25°C. and 760 mm. Hg pressure.

[b]Approximate milligrams of particulate per cubic meter of air.

(No footnote "c" is used to avoid confusion with the "C" that precedes some materials to indicate ceiling value notations.)

[d]An atmospheric concentration of not more than 0.02 p.p.m., or personal protection may be necessary to avoid headache.

[e]As sampled by method that does not collect vapor.

[f]For control of general room air, biologic monitoring is essential for personnel control.

Other Materials

Individual standards have been issued for the following; consult referenced sections for details:

Material	Reference
Asbestos.	1910.1001
Coal tar pitch volatiles; interpretation of term.	1910.1002
4-Nitrobiphenyl.	1910.1003
alpha-Naphthylamine.	1910.1004
Methyl chloromethyl ether	1910.1006
3,3'-Dichlorobenzine (and its salts)	1910.1007
bis-Chloromethyl ether.	1910.1008
beta-Naphthylamine.	1910.1009
Benzidine.	1910.1010
4-Aminodiphenyl.	1910.1011
Ethyleneimine.	1910.1012
beta-Propiolactone.	1910.1013
2-Acetylaminofluorene.	1910.1014
4-Dimethylaminoazobenzine.	1910.1015
N-Nitrosodimethylamine.	1910.1016
Vinyl chloride.	1910.1017

Mineral Dusts

Substance	Mppcf[c]	Mg/M³
Silica:		
Crystalline:		
Quartz (respirable)	250[f] / % SiO_2 + 5	10mg/M³[e] / % SiO_2 + 2
Quartz (total dust)	—	30mg/M³ / % SiO_2 + 2
Cristobalite: Use ½ the value calculated from the count or mass formulae for quartz.		
Tridymite: Use ½ the value calculated from the formulae for quartz.		
Amorphous, including natural diatomaceous earth	20	80mg/M³ / % SiO_2
Silicates (less than 1% crystalline silica):		
Mica	20	
Soapstone	20	
Talc (non-asbestos-form)	20[e]	
Talc (fibrous). Use asbestos limit		
Tremolite (see talc, fibrous)		
Portland cement	50	
Graphite (natural)	15	
Coal dust (respirable fraction less than 5% SiO_2)	—	2.4mg/M³ or 10 mg/M³ / % SiO_2 + 2
For more than 5% SiO_2	—	
Inert or Nuisance Dust:		
Respirable fraction	15	5mg/M³
Total dust	50	15mg/M³

Note: Conversion factors —
mppcf × 35.3 = million particles per cubic meter
= particles per c.c.

[c]Millions of particles per cubic foot of air, based on impinger samples counted by light-field technics.

[f]The percentage of crystalline silica in the formula is the amount determined from air-borne samples, except in those instances in which other methods have been shown to be applicable.

[e]Both concentration and percent quartz for the application of this limit are to be determined from the fraction passing a size-selector with the following characteristics:

[g]Containing <1% quartz; if >1% quartz, use quartz limit.

8 Hour Time Weighted Averages and Acceptable Ceiling Concentrations

Acceptable maximum peak above the acceptable ceiling concentration for an 8-hour shift.

Lmes
6616

OSHA Compliance Checklist

Substance	Exposure Limits p.p.m.*	mg./M³
ride, see 1,1-		
ne	—	—
line — Skin	20	94
	—	15
dust	—	1
	—	2.5
	0.1	0.2
methane	1,000	5,600
	5	9
in	5	20
	50	200
Epoxy-1-propanol)	50	150
yl ether, see		
inol	—	—
e Azinphosmethyl	—	—
	—	0.5
Skin	—	0.5
ntane,	500	2,000
ane — Skin	1	10
hthalene — Skin	—	0.2
ate	500	1,500
	100	410
	100	410
tate	50	300
Skin	1	1.3
nide	3	10
hloride	5	7
ide — Skin	10	11
xide (90%)	1	1.4
nide	0.05	0.2
	—	2
	0.1	1
ne	—	10
	100	525
	100	360
ne	150	700
	100	300
	35	140
ate	350	950
	400	980
e	5	12
	500	2,100
	50	240
	0.5	0.9
e	—	0.15
um	—	0.5
de	—	0.025
d petroleum		
	1,000	1,800
ne	—	15
Skin	—	15
e	0.25	1
	—	5
	25	100
see Methyl		
	—	—
	—	15
see Methyl		
	—	—
	200	810
ene (propyne)	1,000	1,650
ene-propadiene		
APP)	1,000	1,800
e — Skin	1	35
ethoxymethane)	1,000	3,100
	200	480
	10	12
lcohol, see		
utyl carbinol	—	—
l) ketone (2-		
	100	465

Substance	Exposure Limits p.p.m.*	mg./M³
Methyl isobutyl carbinol — Skin	25	100
Methyl isobutyl ketone see Hexone	—	—
Methyl isocyanate — Skin	0.02	0.05
C Methyl mercaptan	10	20
Methyl methacrylate	100	410
Methyl propyl ketone, see 2-Pentanone	—	—
Cα Methyl styrene	100	480
C Methylene bisphenyl isocyanate (MDI)	0.02	0.2
Molybdenum:		
Soluble compounds	—	5
Insoluble compounds	—	15
Monomethyl aniline — Skin	2	9
C Monomethyl hydrazine — Skin	0.2	0.35
Morpholine — Skin	20	70
Naphtha (coal tar)	100	400
Naphthalene	10	50
Nickel carbonyl	0.001	0.007
Nickel, metal and soluble cmpds, as Ni	—	1
Nicotine — Skin	—	0.5
Nitric acid	2	5
Nitric oxide	25	30
p-Nitroaniline — Skin	1	6
Nitrobenzene — Skin	1	5
p-Nitrochlorobenzene — Skin	—	1
Nitroethane	100	310
Nitrogen dioxide	5	9
Nitrogen trifluoride	10	29
Nitroglycerin — Skin	0.2	2
Nitromethane	100	250
1-Nitropropane	25	90
2-Nitropropane	25	90
Nitrotoluene — Skin	5	30
Nitrotrichloromethane, see Chloropicrin	—	—
Octachloronaphthalene — Skin	—	0.1
Octane	500	2,350
Oil mist, mineral	—	5
Osmium tetroxide	—	0.002
Oxalic acid	—	1
Oxygen difluoride	0.05	0.1
Ozone	0.1	0.2
Paraquat — Skin	—	0.5
Parathion — Skin	—	0.11
Pentaborane	0.005	0.01
Pentachloronaphthalene — Skin	—	0.5
Pentachlorophenol — Skin	—	0.5
Pentane	1,000	2,950
2-Pentanone	200	700
Perchloromethyl mercaptan	0.1	0.8
Perchloryl fluoride	3	13.5
Petroleum distillates (naphtha)	500	2,000
Phenol — Skin	5	19
p-Phenylene diamine — Skin	—	0.1
Phenyl ether (vapor)	1	7
Phenyl ether-biphenyl mixture (vapor)	1	7
Phenylethylene, see Styrene	—	—
Phenyl glycidyl ether (PGE)	10	60
Phenylhydrazine — Skin	5	22
Phosdrin (Mevinphos®) — Skin	—	0.1
Phosgene (carbonyl chloride)	0.1	0.4
Phosphine	0.3	0.4
Phosphoric acid	—	1
Phosphorus (yellow)	—	0.1
Phosphorus pentachloride	—	1
Phosphorus pentasulfide	—	1
Phosphorus trichloride	0.5	3

Substance	Exposure Limits p.p.m.*
Propyne, see Methylacetylene	—
Pyrethrum	—
Pyridine	5
Quinone	0.1
RDX — Skin	—
Rhodium, Metal fume and dusts, as Rh	—
Soluble salts	—
Ronnel	—
Rotenone (commercial)	—
Selenium compounds (as Se)	—
Selenium hexafluoride	0.05
Silver, metal and soluble compounds	—
Sodium fluoroacetate (1080) — Skin	—
Sodium hydroxide	—
Stibine	0.1
Stoddard solvent	500
Strychnine	—
Sulfur dioxide	5
Sulfur hexafluoride	1,000
Sulfuric acid	—
Sulfur monochloride	1
Sulfur pentafluoride	0.01
Sulfuryl fluoride	5
Systox, see Demeton®	—
2,4,5T	—
Tantalum	—
TEDP — Skin	—
Tellurium	—
Tellurium hexafluoride	0.02
TEPP — Skin	—
C Terphenyls	1
1,1,1,2-Tetrachloro-2,2-difluoro-ethane	500
1,1,2,2-Tetrachloro-1,2-difluoro-ethane	500
1,1,2,2-Tetrachloroethane — Skin	5
Tetrachloroethylene, see Perchloroethylene	—
Tetrachloromethane, see Carbon tetrachloride	—
Tetrachloronaphthalene — Skin	—
Tetraethyl lead (as Pb) — Skin	—
Tetrahydrofuran	—
Tetramethyl lead (as Pb) — Skin	—
Tetramethyl succinonitrile — Skin	0.5
Tetranitromethane	1
Tetryl (2,4,6-trinitrophenyl-methylnitramine) — Skin	—
Thallium (soluble compounds) — Skin as Tl	—
Thiram	—
Tin (inorganic cmpds, except oxides)	—
Tin, organic cmpds;	
o-Toluene-2,4-diisocyanate	
o-Toluidine — Skin	5
Toxaphene, see Chlorinated camphene	—
Tributyl phosphate	—
1,1,2-Trichloroethane, see Methyl chloroform	
Trichloroethylene, see Ethylene trichloride	
Trichloromethane, see Chloroform	—

adhesives age
MANUFACTURE APPLICATION TECHNOLOGY RESEARCH AND MARKETING
DECEMBER 1976

AIR CONTAMINANTS

Reference: 1910.1000, OSHA General Industry Standards.
Items that apply most directly to the adhesives industry appear in red.

Substance	Exposure Limits p.p.m.*	mg./M³*
Acetaldehyde	200	360
Acetic acid	10	25
Acetic anhydride	5	20
Acetone	1,000	2,400
Acetonitrile	40	70
Acetylene dichloride, see 1, 2-Dichloroethylene	—	—
Acetylene tetrabromide	1	14
Acrolein	0.1	0.25
Acrylamide — Skin	—	0.3
Acrylonitrile — Skin	20	45
Aldrin — Skin	—	0.25
Allyl alcohol — Skin	2	5
Allyl chloride	1	3
C Allyl glycidyl ether (AGE)	10	45
Allyl propyl disulfide	2	12
2-Aminoethanol, see Ethanolamine	—	—
2-Aminopyridine	0.5	2
Ammonia	50	35
Ammonium sulfamate (Ammate)	—	15
n-Amyl acetate	100	525
sec-Amyl acetate	125	650
Aniline — Skin	5	19
Anisidine (o, p-isomers) — Skin	—	0.5
Antimony and compounds (as Sb)	—	0.5
ANTU (alpha naphthyl thiourea)	—	0.3
Arsenic and compounds (as As)	—	0.5
Arsine	0.05	0.2
Azinphos-methyl — Skin	—	0.2
Barium (soluble compounds)	—	0.5
p-Benzoquinone, See Quinone	—	—
Benzoyl peroxide	—	5
Benzyl chloride	1	5
Biphenyl, see Diphenyl	—	—
Bisphenol A, see Diglycidyl ether	—	—
Boron oxide	—	15
C Boron trifluoride	1	3
Bromine	0.1	0.7
Bromoform — Skin	0.5	5
Butadiene (1,3-butadiene)	*1,000*	*2,200*
Butanethiol, see Butyl mercaptan	—	—
2-Butanone	200	590
2-Butoxy ethanol (Butyl Cellosolve) — Skin	50	240
Butyl acetate (n-butyl acetate)	150	710
sec-Butyl acetate	200	950
tert-Butyl acetate	200	950
Butyl alcohol	100	300
sec-Butyl alcohol	150	450
tert-Butyl alcohol	100	300
C Butylamine — Skin	5	15
C tert-Butyl chromate (as CrO_3) — Skin	—	0.1
n-Butyl glycidyl ether (BGE)	50	270
Butyl mercaptan	10	35
p-tert-Butyltoluene	10	60
Calcium arsenate	—	1
Calcium oxide	—	5
Camphor	2	—
Carbaryl (Sevin®)	—	5
Carbon black	—	3.5
Crotonaldehyde	2	6
Cumene — Skin	50	245
Cyanide (as CN) — Skin	—	5
Cyclohexane	300	1,050
Cyclohexanol	50	200
Cyclohexanone	50	200
Cyclohexene	300	1,015
Cyclopentadiene	75	200
2, 4-D	—	10
DDT — Skin	—	1
DDVP, see Dichlorvos	—	—
Decaborane — Skin	0.05	0.3
Demeton® — Skin	—	0.1
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	50	240
1,2-diaminoethane, see Ethylenediamine	—	—
Diazomethane	0.2	0.4
Diborane	0.1	0.1
Dibutylphthalate	—	5
C o-Dichlorobenzene	50	300
p-Dichlorobenzene	75	450
Dichlorodifluoromethane	1,000	4,950
1,3-Dichloro-5, 5-dimethyl hydantoin	—	0.2
1,1-Dichloroethane	100	400
1,2-Dichloroethylene	200	790
C Dichloroethyl ether — Skin	15	90
Dichloromethane, see Methylenechloride	—	—
Dichloromonofluoromethane	1,000	4,200
C-1,1-Dichloro-1-nitroethane	10	60
1,2-Dichloropropane, see Propylenedichloride	—	—
Dichlorotetrafluoroethane	1,000	7,000
Dichlorvos (DDVP) — Skin	—	1
Dieldrin — Skin	—	0.25
Diethylamine	25	75
Diethylamino ethanol — Skin	10	50
Diethylether, see Ethyl ether	—	—
Difluorodibromomethane	100	860
C Diglycidyl ether (DGE)	0.5	2.8
Dihydroxybenzene, see Hydroquinone	—	—
Diisobutyl ketone	50	290
Diisopropylamine — Skin	5	20
Dimethoxymethane, see Methylal	—	—
Dimethyl acetamide — Skin	10	35
Dimethylamine	*10*	*18*
Dimethylaminobenzene, see Xylidene	—	—
Dimethylaniline(N-dimethyl-aniline) — Skin	5	25
Dimethylbenzene, see Xylene	—	—
Dimethyl 1,2-dibromo-2,2-dichloroethyl phosphate, (Dibrom)	—	3
Dimethylformamide — Skin	10	30
2,6-Dimethylheptanone, see Diisobutyl ketone	—	—
1,1-Dimethylhydrazine — Skin	0.5	1
Dimethylphthalate	—	5
Dimethylsulfate — Skin	1	5
Dinitrobenzene (all isomers) — Skin	—	1
Dinitro-o-cresol — Skin	—	0.2
Dinitrotoluene — Skin	—	1.5
Dioxane (Diethylene dioxide) — Skin	100	360
Diphenyl	0.2	1
Diphenylmethane diisocyanate		

Substance

Ethylidine ch
Dichloroet
N-Ethylmorp
Ferbam
Ferrovanadi
Fluoride (as
Fluorine
Fluorotrichlc
Formic acid
Furfural —
Furfuryl alc
Glycidol (2,
Glycol mono
2-Ethoxye
Guthion®
Hafnium
Heptachlor
Heptane
Hexachloroe
Hexachloror
Hexane
2-Hexanone
Hexone (M
sec-Hexyl a
Hydrazine -
Hydrogen b
C Hydrogen
Hydrogen cy
Hydrogen pe
Hydrogen si
Hydroquinor
C Iodine
Iron oxide I
Isoamyl ac
Isoamyl alc
Isobutyl al
Isobutyl ac
Isobutyl ni
Isocyanate
Isophorone
Isopropyl ac
Isopropyl et
Isopropyl g
Ketene
Lead arsen
Lindane —
Lithium hyc
L.P.G. (liqui
gas
Magnesi
Malathion -
Maleic an
C Mangane
Mesityl ox
Methanethic
mercapta
Methoxychl
2-Methoxy
Cellos
Methyl a
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mixture (
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Methylal (d
Methyl al
Methylamin
Methyl amy
Methyl is
Methyl (n-a
Heptanor

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Material	8-hour time weighted average	Acceptable ceiling concentration	Concentration	Maximum duration
Benzene (Z37.4-1969)	10 p.p.m	25 p.p.m	50 p.p.m	10 minutes.
Beryllium and beryllium compounds (Z37.29-1970)	2 µg./M³	5 µg./M³	25 µg./M³	30 minutes.
Cadmium fume (Z37.5-1970)	0.1 mg./M³	3 mg./M³	—	
Cadmium dust (Z37.5-1970)	0.2 mg./M³	0.6 mg./M³	—	
Carbon disulfide (Z37.3-1968)	20 p.p.m	30 p.p.m	100 p.p.m	Do.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Chromic acid and chromates (Z37.7-1971)	—	do	—	
Ethylene dibromide (Z37.31-1970)	20 p.p.m	30 p.p.m	50 p.p.m	5 minutes.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Fluoride as dust (Z37.28-1969)	2.5 mg./M³	—	—	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Hydrogen fluoride (Z37.28-1969)	do	—	—	
Hydrogen sulfide (Z37.2-1966)	—	20 p.p.m	50 p.p.m	10 minutes once only if no other measurable exposure occurs.
[illegible]	[illegible]	—	—	
Mercury (Z37.8-1971)	—	1 mg./10M³	—	
Methyl chloride (Z37.18-1969)	100 p.p.m	200 p.p.m	300 p.p.m	5 minutes in any 3 hours.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Organo (alkyl) mercury (Z37.30-1969)	0.01 mg./M³	0.04 mg./M³	—	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Tetrachloroethylene (Z37.22-1967)	do	do	do	5 minutes in any 3 hours.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

E PROTECTION

ed	Reference
re Extinguishers	1910.157
and Hose Systems	1910.158
Sprinkler Systems	1910.159
Chemical shing Systems	1910.160
oxide Extinguishing	1910.161
Alarm Signaling	1910.163

L ENVIRONMENTAL CONTROLS

ELECTRICAL REQUIREMENTS

Reference: 1910.309

(a) The requirements contained in the following articles and sections of the National Electrical Code, NFPA No. 70-1971; ANSI C1-1971 (Rev. of C1-1968) shall apply to all electrical installations and utilization equipment:

Articles:	
500	Hazardous Locations.
501	Class I Installations (Hazardous Locations).
502	Class II Installations (Hazardous Locations).
503	Class III Installations (Hazardous Locations).
Sections:	
250-58 (a)-(b).	Equipment on Structural Metal.
250-59 (a). (b), and (c).	Portable and/or Cord Connected and Plug Connected Equipment, Grounding Method.
400-3 (a)-(b).	Flexible Cords and Cable, Uses.
400-4	Flexible Cords and Cable Prohibited.
400-5	Flexible Cords and Cables, Splices.
400-9	Overcurrent Protection and Ampacities of Flexible Cords.
410-10	Pull at Joints and Terminals of Flexible Cords and Cables.
422-8	Installation, Appliances w/Flexible Cords.
422-9	Installation, Portable Immersion Heaters.
422-10	Installation, Appliances Adjacent to Combustible Material.
422-11	Stands for Portable Appliances.
422-12	Signals for Heated Appliances.
422-14	Water Heaters.
422-15 (a). (b).	Installation of Infrared Lamp and Industrial Heating Appliances.

Kmes 6649

stone, see 2-	—	—
olve — Skin	25	80
olve acetate —	25	120
form	350	1,900
xane	500	2,000
xanol	100	470
iexanone — Skin	100	460
	—	—
e	100	250
— Skin	5	28

Picric acid — Skin	—	0 1
Pival (2-Pivalyl-1,3-indandione)	—	0 1
Platinum (Soluble Salts) as Pt	—	0 002
Propargyl alcohol — Skin	1	—
Propane	1,000	1,800
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
n-Propyl nitrate	25	110
Propylene dichloride	75	350
Propylene imine — Skin	2	5
Propylene oxide	100	240

1,2,3-Trichloropropane	50
1,1,2-Trichloro 1,2,2-trifluoro-ethane	1,000
Triethylamine	25
Trifluoromonobromomethane	1,000
2,4,6-Trinitrophenol, see Picric acid	—
2,4,6-Trinitrophenylmethyl-nitramine, see Tetryl	—
Trinitrotoluene — Skin	—
[illegible]	—
Turpentine	100

How To Use This Checklist

e various sections within this chart represent as designated under the Occupational Safety l Health Act as crucial to the safe operation of ir plant. To see how your plant measures up to HA standards, evaluate conditions in each of areas that appear on this checklist. The re-ences indicate the sections of the Act that ply. This checklist does not represent the com-te scope of the Act. For specific situations not covered here, a thorough study of the compl OSHA Standards is recommended. An ongoi subscription to the OSHA General Industry St dards and Interpretations and all changes as th are enacted can be obtained for $21.00 from t Occupational Safety and Health Subscription Se vice, care of the Superintendent of Documen U.S. Government Printing Office, Washingt D.C. 20402.

CTIVE

	Reference
	1910.133
	1910.134
	1910.135
on	1910.136
as	1910.137

SS

	Reference
	1910.36

HAZARDOUS MATERIALS

Material	Reference
☐ Compressed Gas	1910.101
☐ Acetylene	1910.102
☐ Hydrogen	1910.103
☐ Oxygen	1910.104
☐ Nitrous Oxide	1910.105
☐ Flammable and Combustible Liquids	1910.106
☐ Spray Finishing Using Flammable and Combustible Liquids	1910.107
☐ Dip Tanks Containing Flammable or Combustible Liquids	1910.108
☐ Explosives and Blasting Agents	1910.109

FIR

To Be Chec

- ☐ Portable
- ☐ Standpip
- ☐ Automatic
- ☐ Fixed Dry Extingu
- ☐ Carbon D System
- ☐ Local Fire System

Kmess GENER

Carbon monoxide	50	55
Chlordane — Skin	—	0.5
Chlorinated camphene — Skin	—	0.5
Chlorinated diphenyl oxide	—	0.5
Chlorine	1	3
Chlorine dioxide	0.1	0.3
C Chlorine trifluoride	0.1	0.4
C Chloroacetaldehyde	1	3
α-Chloroacetophenone (phenacylchloride)	0.05	0.3
Chlorobenzene (monochlorobenzene)	75	350
o-Chlorobenzylidene malononitrile (OCBM)	0.05	0.4
Chlorobromomethane	200	1,050
2-Chloro-1,3-butadiene, see Chloroprene	—	—
Chlorodiphenyl (42 percent Chlorine) — Skin	—	1
Chlorodiphenyl (54 percent Chlorine) — Skin	—	0.5
1-Chloro-2,3-epoxypropane, see Epichlorohydrin	—	—
2-Chloroethanol, see Ethylene chlorohydrin	—	—
Chloroethylene, see Vinyl chloride	—	—
C Chloroform (trichloromethane)	50	240
1-Chloro-1-nitropropane	20	100
Chloropicrin	0.1	0.7
Chloroprene (2-chloro-1,3-butadiene) — Skin	25	90
Chromium, sol. chromic, chromous salts as Cr	—	0.5
Metal and insol. salts	—	1
Coal tar pitch volatiles (benzene soluble fraction) anthracene, BaP, phenanthrene, acridine, chrysene, pyrene	—	0.2
Cobalt, metal fume and dust	—	0.1
Copper fume	—	0.1
Dusts and Mists	—	1
Cotton dust (raw)	—	1
Crag® herbicide	—	15
Cresol (all isomers) — Skin	5	22

cyanate, MO	—	—
Dipropylene glycol methyl ether — Skin	100	600
Di-sec. octyl phthalate (Di-2-ethylhexylphthalate)	—	5
Endrin — Skin	—	0.1
Epichlorhydrin — Skin	5	19
EPN — Skin	—	0.5
1,2-Epoxypropane, see Propyleneoxide	—	—
2,3-Epoxy-1-propanol, see Glycidol	—	—
Ethanethiol, see Ethylmercaptan	—	—
Ethanolamine	3	6
2-Ethoxyethanol — Skin	200	740
2-Ethoxyethylacetate (Cellosolve acetate) — Skin	100	540
Ethyl acetate	400	1,400
Ethyl acrylate — Skin	25	100
Ethyl alcohol (ethanol)	1,000	1,900
Ethylamine	10	18
Ethyl sec-amyl ketone (5-methyl-3-heptanone)	25	130
Ethyl benzene	100	435
Ethyl bromide	200	890
Ethyl butyl ketone (3-Heptanone)	50	230
Ethyl chloride	1,000	2,600
Ethyl ether	400	1,200
Ethyl formate	100	300
C Ethyl mercaptan	10	25
Ethyl silicate	100	850
Ethylene chlorohydrin — Skin	5	16
Ethylenediamine	10	25
Ethylene dibromide, see 1,2-Dibromoethane	—	—
Ethylene dichloride, see 1,2-Dichloroethane	—	—
C Ethylene glycol dinitrate and/or Nitroglycerin — Skin	0.2	1
Ethylene glycol monomethyl ether acetate, see Methyl Cellosolve acetate	—	—
Ethylene imine — Skin	0.5	
Ethylene oxide	50	9(

Methyl but-
Hexanon
Methyl Ca
Methyl Ce
Skin
Methyl ch
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Methylcycl
o-Methylcy
Methyl for
Methyl iod

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WALKING — WORKING SURFACES

To Be Checked	Reference
☐ Floor and Wall Openings and Holes	1910.23
☐ Fixed Industrial Stairs	1910.24
☐ Portable Wood Ladders	1910.25
☐ Portable Metal Ladders	1910.26
☐ Fixed Ladders	1910.27
☐ Scaffolding	1910.28
☐ Manually Propelled Mobile Ladder Stands and Scaffolds	1910.29
☐ Other Working Surfaces	1910.30

PERSONAL PROTI EQUIPMEN

To Be Checked

- ☐ Eye and Face Protection
- ☐ Respiratory Protection
- ☐ Occupational Head Protection
- ☐ Occupational Foot Protec
- ☐ Electrical Protective Devi

Kmbb 6651

MEANS OF EGR

General Requirements

:d	Reference
	1910.141
:arriage Disposal	1910.143
Physical Hazards	1910.144
'evention Signs	1910.145

AL SERVICES AND FIRST AID

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shall ensure the ready availability nel for advice and consultation on ıalth.

of an infirmary, clinic, or hospital in he workplace which is used for the jured employees, a person or perquately trained to render first aid. pproved by the consulting physician ailable.

ıs or body of any person may be ous corrosive materials, suitable drenching or flushing of the eyes and ovided within the work area for ıncy use.

110-17 (a)-(c).	Guarding Live Part.
110-18	Arcing Parts.
110-21	Marking.
110-22	Identification.
240-16 (a), (b), (c), and (d).	Location in Premises (for Overcurrent Protection Devices).
240-19 (a) and (b).	Guarding of Arcing or Suddenly Moving Parts of Overcurrent Protection Devices.
250-3 (a)-(b).	D.C. System Grounding.
250-5 (a)-(c).	A.C. Circuits & Systems To Be Grounded.
250-7	Circuits Not To Be Grounded.
250-42 (a)-(d).	Fixed Equipment Grounding, General.
250-43 (a)-(i).	Fixed Equipment Grounding, Specific.
250-44 (a)-(e).	Nonelectrical Equipment Grounding.
250-45 (a), (b), (c), and (d).	Equipment Connected by Cord and Plug, Grounding.
430-142 (a)-(d).	Stationary Motor, Grounding.
430-143	Portable Motors, Grounding.
250-50 (a)-(b).	Equipment Grounding Connections.
250-51	Effective Grounding.
250-57 (a)-(b).	Fixed Equipment Method of Grounding.
422-16	Appliance Grounding.
422-17	Installation of Wall-mounted Ovens and Counter-mounted Cooking Units.

(b) Every new electrical installation and all new utilization equipment installed after March 15, 1972, and every replacement, modification, or repair or rehabilitation, after March 15, 1972, of any part of any electrical installation or utilization equipment installed before March 15, 1972, shall be installed or made, and maintained, in accordance with the Provisions of the 1971 National Electrical Code, NFPA No. 70-1971; ANSI C1-1971 (Rev. of C1-1968).

(c) Notwithstanding the provisions of paragraphs (a) and (b) of this section, the effective date of the requirement in section 210-7 of the National Electrical Code, that all 15- and 20-ampere receptacle outlets on single-phase circuits for construction sites shall have approved ground-fault circuit protection for personnel, is postponed pending reconsideration of the requirement.

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KMBB 6652

the acceptable ceiling concentration for an 8-hour shift.

☐ Liquid Petroleum Gases 1910.110

☐ Anhydrous Ammonia 1910.111

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To Be Check

☐ Sanitation

☐ Nonwater S Systems

☐ Marking of

☐ Accident P and Tags

OCCUPATIONAL NOISE EXPOSURE

Reference: 1910.95
Permissible Noise Exposures[1] (Table G-16)

Duration per day (hours)	Sound level dBA slow response
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110
¼ or less	115

[1]When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions: *C1/T1 + C2/T2 . . . Cn/Tn* exceeds unity, then, the mixed exposure should be considered to exceed the limit value. *Cn* indicates the total time of exposure at a specified noise level, and *Tn* indicates the total time of exposure permitted at that level.

Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

MEDIC

Reference 1910.15

(a) The employer of medical perso matters of plant he (b) In the absence near proximity to t treatment of all in sons shall be ade First aid supplies a shall be readily av (c) Where the ey exposed to injur facilities for quick body shall be pr immediate emerge

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KM66 6653

Ketone (2- ... 100 465 | Phosphorus pentasulfide ... — 1 | Trichloromethane, see

MATERIALS HANDLING AND STORAGE

To Be Checked		Reference
☐	Handling Materials-General	1910.176
☐	Indoor General Storage	1910.177
☐	Powered Industrial Trucks	1910.178

MACHINERY AND MACHINE GUARDING

		Reference
	General Requirements	1910.212
To Be Checked		
☐	Types of Guarding	1910.212
☐	Point of Operation Guarding	1910.212
☐	Barrels, Containers, Drums	1910.212
☐	Exposure of Blades	1910.212
☐	Anchoring of Fixed Machinery	1910.212

To Be Checked

- ☐ Exit Components
- ☐ Protective Enclosure of
- ☐ Width and Capacity
- ☐ Egress Capacity and Occupant Load
- ☐ Arrangement of Exits
- ☐ Access to Exits
- ☐ Exterior Ways of Exit A
- ☐ Discharge from Exits
- ☐ Headroom
- ☐ Changes in Elevation
- ☐ Maintenance and Workmanship
- ☐ Furnishings and Decorati
- ☐ Automatic Sprinkler Syst
- ☐ Alarm and Fire Protectio Systems
- ☐ Fire Retardant Paints
- ☐ Exit Markings

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Knee 665.1

Carbaryl (Sevin®)	—	5	Diphenyl	0.2	1	Methyl (n-Heptano

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B. J. Kotsher
Publisher
Adhesives Age



Mary C. McMurrer
Editor
Adhesives Age

THE Occupational Safety and Health Act has far-reaching implications for all who engage in the manufacture of goods or who provide commercial services. In the adhesives industry, which is but a single segment of all U.S. industrial activity, OSHA has received a great deal of attention and has been the subject of many hours of discussion and planning within individual companies and by industry organizations.

Nevertheless, the very scope of the Act has made its comprehension a formidable undertaking for harried management in the average adhesives manufacturing company. The everyday concerns of business operations, the many environmental regulations that demand compliance, and a host of hazardous material and consumer safety controls leave little of management's working time for concentration on so broad and all-inclusive a subject as the safety of workers in the manufacturing environment.

With these considerations in mind, the staff of ADHESIVES AGE has undertaken to provide adhesives management with a working checklist of what is required to achieve compliance with the Occupational Safety and Health Act. In compiling this checklist, we have reviewed the provisions of the Act and have culled out those that most directly apply to such installations as may be found in the adhesives industry. The checklist in this fold-out insert is intended to spotlight the most common areas of safety concern for adhesives plants; it is not intended to be a complete digest of the entire Act.

We strongly urge company management to obtain complete copies of the OSHA Standards, and to become familiar with them. Perhaps the best way is to secure a subscription to the OSHA Standards service provided by the U.S. Government Printing Office, Washington, D.C. 20402. At a one-time cost of $21.00, such a subscription furnishes a complete copy of the Act, plus all changes as they are enacted from time to time.

The ADHESIVES AGE OSHA compliance checklist has been referenced to provide management with a guide to the sections of the Act that apply to the areas covered. With a copy of the Standards in hand, the plant manager can tell at a glance what safety measures must be taken, and where to find the appropriate regulations.

One word of caution: It is impossible to anticipate every manufacturing situation and every plant feature. Where conditions not covered by the checklist exist, a thorough search of the OSHA Standards must be carried out by plant management, in order to accurately determine specific compliance requirements.

Safety in the workplace is everyone's business. We trust that this OSHA checklist will assist adhesives management in the performance of this important obligation.

We at ADHESIVES AGE welcome the participation of the Coatings and Adhesives Materials Department of Union Carbide Corporation as the sponsor of this special fold-out OSHA compliance checklist. The long history of devotion to high safety standards at Union Carbide makes it most appropriate for that company to join in this effort toward the achievement of higher safety standards for the entire adhesives industry.

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