



## Regulatory Information for Chemicals Used in AASHTO Tests

AASHTO DESIGNATION: R 16-93

### 1. SCOPE

1.1. This Recommended Practice provides a reference listing of chemicals used in the various AASHTO Test Methods. It includes current regulatory codes and hazard classifications. The list does not include radiation hazards. This practice is not intended as a substitute for law or regulation.

1.2. The chemical list must be provided to all laboratory employees engaged in performing AASHTO tests. In addition, all laboratory employees must be trained in proper handling procedures as stated in the OSHA 1910.1200 Hazard Communication Standard or governing state regulation. Laboratories performing AASHTO tests shall establish a Chemical Hygiene Plan as set out in 29 CFR 1910.1450, including the training requirements therein.

1.3. This practice supplements data found in MSDS's supplied by manufacturers. This practice is for quick reference ability and is not intended to replace MSDS's.

### 2. INTRODUCTION

2.1. In an effort to assure uniform compliance with regulations, the following definitions are cited:

2.1.1. A hazardous chemical includes any substance which is in the definition of health hazard adopted by the United States Occupational Safety and Health Administration.

2.1.2. A hazardous waste includes, but is not limited to, any substance which has been assigned a code number from the EPA "Unlisted (Characteristic) Hazardous Wastes" code. All hazardous waste must be disposed of in accordance with EPA, state and local regulations.

2.2. Should there be any questions as to whether a substance is hazardous, contact the local governing authority.

### 3. CHEMICAL LIST

3.1. This section contains definitions of the terms and abbreviations contained in the list. All information is valid as of the date of this practice.

3.2. CAS NO. is the number assigned to a substance by the Chemical Abstracts Service.

3.3. TEST METHOD refers to the AASHTO test method in which the chemical is used.

3.4. NIOSH REL is the Recommended Exposure Limit established by the National Institute for Occupational Safety and Health. The value corresponds to the concentration in air to which the employee may be exposed. These limits are a time weighted average for an 8-hour work day.

3.4.1. Abbreviations under NIOSH REL and OSHA PEL:

ppm is parts per million  
mg/m<sup>3</sup> is milligrams per cubic meter  
ug/m<sup>3</sup> is micrograms per cubic meter  
CL is Ceiling Limit  
STEL is Short Term Exposure Limit, which is for a 15-minute duration  
f is fume  
d is dust  
rf is respirable fraction

3.5. OSHA PEL is the Permissible Exposure Limit established by the Occupational Safety and Health Administration. These PELs went into effect September 1, 1989. The PELs are time weighted average concentrations just as the NIOSH RELs.

3.5.1. See Section 3.4.1 for abbreviations used.

3.6. CARCIN denotes substances which are listed as carcinogens in one of the following three sources:

3.6.1. NTP denotes a substance listed on National Toxicology Program's Annual Report on Carcinogens.

3.6.2. IARC denotes a substance listed in the International Agency for Research on Cancer's Monographs, Groups I and II.

3.6.3. OSHA's 29 CFR 1910 subpart Z.

3.7. SKIN—An "X" in this column denotes a substance where skin contact is to be avoided, as it may be a route of entry. This includes mucous membranes and eyes.

3.8. DOT LABEL denotes Department of Transportation Hazard Class for transportation of these substances.

3.8.1. Abbreviations under DOT LABEL

FLAM. IS FLAMMABLE  
LIQ. IS LIQUID  
ST. ANDR. + is ST. ANDREW'S  
CROSS (POISON LABEL)

3.9. RCRA NO. is the number assigned to a substance under the Resource Conservation and Recovery Act.

3.10. SHIP CODE is the identification number assigned by the U.S. Department of Transportation in the Emergency Response Guidebook to hazardous materials for international and domestic shipment.

3.11. DOT GUIDE is a number assigned by the U.S. Department of Transportation for providing guidance primarily during the initial phases of an incident.

Substance	CAS No.	Test Method	NIOSH REL	OSHA PEL	Carcin.	Skin	DOT Label	RCRA No.	SHIP Codes	DOT Grade
Acetic Acid	64-19-7	60 105 192 281	10 ppm 25 mg/m <sup>3</sup>	10 ppm 25 mg/m <sup>3</sup>			Corrosive Flam. Liq.		UN2789 UN2790	29
Acetone	67-64-1	81 151 201 202 250	250 ppm 590 mg/m <sup>3</sup>	750 ppm 1800 mg/m <sup>3</sup>			Hazardous Flam. Liq.	U002	UN1090	26
Acetylene	74-86-2	263	1 ppm 1 <sup>4</sup> mg/m <sup>3</sup>	CL 2500 ppm			Hazardous Flam. Gas		UN1001	17
Ammonium Acetate	631-61-8	105							NA9079	31
Ammonium Carbonate	10361-29-2	111 143 164								31
Ammonium Chloride	12125-02-9	105 143 263		10 mg/m <sup>3</sup> STEL 20 mg/m <sup>3</sup>					NA9085	31
Ammonium Hydroxide	1336-21-6	60 105 143 144 250 263	X				Corrosive			60
Ammonium Molybdate	12027-67-7	105 263		5 mg(Mo)/m <sup>3</sup>						
Ammonium Nitrate	6484-52-2	105 144					Oxidizer Explosive		NA1942 UN2067 UN2426	35 43
Ammonium Oxalate	1113-38-8	105 143								31
Ammonium Persulfate	7727-54-0	263					Oxidizer			35
Ammonium Phosphate	7783-28-0	143					Oxidizer			
Antimony Trichloride	10025-91-9	65 213		0.5 mg(5b)/m <sup>3</sup>			Corrosive		UN1733	60
Antimonyl Tartrate	X00001-05-8	263	0.5 mg(5b)/m <sup>3</sup>	0.5 mg(5b)/m <sup>3</sup>			Poison St. Andr.†			53
Antimony Reagent	7440-36-0	263	0.5 mg(5b)/m <sup>3</sup>	0.5 mg(5b)/m <sup>3</sup>			Poison St. Andr.†		UN2871	53
Arsenic	7440-38-2	263	2 ug/m <sup>3</sup>		IARC 1 NTP X		Poison B		UN1558	53
Arsenic Trioxide	1327-53-3	105 263	2 ug(As)/m <sup>3</sup>				Poison B	P012	UN1561	53
Barium Chloride	10361-37-2	104 263	0.5 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>						
Barium Hydroxide	17194-00-2	105 263	0.5 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup>						
Benzene	71-43-2	62 110	0.1 ppm CL 1 ppm	10 ppm CL 50 ppm	IARC 1 NTP X		Flammable Liquid	U019	UN1114	27
Cadmium	7440-43-9	263	Lowest Feas. Lim	f: 0.1 mg/m <sup>3</sup> d: 0.2 mg/m <sup>3</sup>	IARC 28 NTP X					
Cadmium Chloride	10108-64-2	105							NA2570	53
Calcium Carbide	75-20-7	217					Flammable Solid			40
Calcium Carbonate	471-34-1	105 260 263		d: 15 mg/m <sup>3</sup> rf: 5 mg/m <sup>3</sup>						
Calcium Hydroxide	1305-62-0	106 132 143 263	X	5 mg/m <sup>3</sup>		Irr.	Caustic			
Calcium Metasilicate	1344-95-2	278 279	X	d: 15 mg/m <sup>3</sup> rf: 5 mg/m <sup>3</sup>						
Calcium Oxide	1305-78-8	218 219 220 258	X	5 mg/m <sup>3</sup>					UN1910	60
Carbon Dioxide	124-38-9	170	10000 ppm	10000 ppm STEL 3000 ppm			Non-Flam. Gas		UN1013 UN1845	21
Carbon Disulfide	75-15-0	42	1 ppm	4 ppm		X			UN2187 UN1131	28
Chloroacetic Acid	79-11-8	60					Corrosive			50
Chloroform	67-66-8	105 151 263	2 ppm	2 ppm	IARC 28 NTP X		Poison B	U044	UN1888	55
Chromic Acid	1308-14-1	74 201 202		CL 0.1 mg/m <sup>3</sup>			Corrosive			60
Cobalt Naphthenate	61789-51-3	278 279					Flammable Solid			32
Copper	7440-50-8	263	1 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>						