

**§ 153.1604****46 CFR Ch. I (10-1-06 Edition)****§ 153.1604 Determining the stripping quantity from the test results.**

(a) For a single test, the stripping quantity is the volume of water calculated under §153.1602(d).

(b) If multiple tests are made on a tank without modifications to the tank, pumping system, or stripping procedure between the tests, the stripping quantity must be taken as the average of the stripping quantities for all of the tests.

(c) If multiple tests are made on a tank with modifications to the tank, pumping system, or stripping procedure between the tests, the stripping quantity is the stripping quantity determined under paragraph (b) of this section using only those tests performed after the last modification.

**§ 153.1608 Calculation of total NLS residue and clingage NLS residue.**

(a) The total NLS residue for each tank is calculated by adding the stripping quantity and the clingage NLS residue.

(b) The clingage NLS residue for each tank is calculated using the following formula:

$$Q_{\text{clingage}} = 1.1 \times 10^{-4} A_d + 1.5 \times 10^{-5} A_w + 4.5 \times 10^{-4} L^{1/2} A_b$$

where:

$A_b$ =Area of the tank bottom added to the area in square meters of tank structural components projected on a horizontal surface

$A_d$ =Area of the tank underdecks added to the area in square meters of tank structural components projected on a horizontal surface

$A_w$ =Area of the tank walls added to the area in square meters of tank structural components projected on a vertical surface

$L$ =Length of tank in meters from fore to aft

$Q_{\text{clingage}}$ =volume of clingage in cubic meters

When using the formula in this paragraph, areas that are inclined more than 30° from the horizontal may be assumed to be vertical.

NOTE: The Commandant (G-MSO) (tel# 202-372-1425) has information that may be useful in approximating surface areas of typical structural members for the projected area calculations under §153.1608(b).

[CGD 81-101, 52 FR 7788, Mar. 12, 1987, as amended by USCG-2006-25697, 71 FR 55747, Sept. 25, 2006]

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TABLE 1 TO PART 153—SUMMARY OF MINIMUM REQUIREMENTS

Cargo name	IMO Annex II Pollution Cat-egory	Haz.	Cargo contain-ment system	Vent height	Vent	Gauge	Fire pro-tection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
Acetic acid .....	D	S	III	4m	PV	Restr	A	.238(a), .409, .527, .554, .933 .....	I-D
Acetic anhydride .....	D	S	II	4m	PV	Restr	A	.238(a), .409, .526, .527, .554, .933 .....	I-D
Acetochlor .....	A	P	II	NR	Open	Open	A	.409 .....	NA
Acetone cyanohydrin .....	A	S/P	II	B/3	PV	Closed	A	.238(a), .316, .408, .525, .526, .527, .912(a)(2), .933, .1002, .1004, .1020, .1035, .409, .525, .526, .1020 .....	I-D
Acetonitrile .....	III	S	II	B/3	PV	Restr	A	.409 .....	I-D
Acrylamide solution (50% or less) .....	D	S	II	NR	Open	Closed	NSR	.409, .525(a), (c), (d), (e), .912(a)(1), .1002(a), .1004, .1020 .....	NA
Acrylic acid .....	D	S	III	4m	PV	Restr	A	.238(a), .409, .526, .912(a)(1), .933, .1002(a), .1004 .....	I-D s
Acrylonitrile .....	B	S/P	II	B/3	PV	Closed	A	.236(a), (c), (d), .316, .408, .525, .526, .527, .912(a)(1), .1004, .1020 .....	I-D
Adiponitrile .....	D	S	III	4m	PV	Restr	A	.526 .....	I-D
Alachlor .....	B	S/P	II	NR	Open	Open	A	.238(a), .409, .440, .488, .908(a), (b) .....	NA
Alcohol (C6–C17) (secondary) poly(3-6)ethoxylates.	A	P	II	NR	Open	Open	A	.409 .....	NA
Alcohol (C6–C17) (secondary) poly(7–12)ethoxylates.	B	P	III	NR	Open	Open	A	.409, .440, .908(a), (b) .....	NA
Alcohol(C9–C11) poly(2.5–9) ethoxylates ..	B	P	III	NR	Open	Open	A	.409, .440, .908(a) .....	NA
Alcohol(C12–C15) poly(...ethoxylates, see Alcohol(C12–C16)) poly(...ethoxylates.									NA
Alcohol(C12–C16) poly(1–6)ethoxylates ..	A	P	II	NR	Open	Open	A	.409 .....	NA
Alcohol(C12–C16) poly(7–9)ethoxylates ..	B	P	III	NR	Open	Open	A	.409, .440, .908(a) .....	NA
Alcohol(C12–C16) poly(20+)ethoxylates ..	C	P	III	4m	PV	Restr	A	None .....	NA
Alkanes(C6–C9) ( <i>all isomers</i> ) .....	C	P	III	NR	Open	Open	NSR	.409 .....	I-D
Alkane(C14–C17) sulfonic acid, sodium salt solution (65% or less).	B	P	III	NR	Open	Open	A	.409, .908(a) .....	NA
Alkaryl polyether (C9–C20) .....	B	P	III	B/3	PV	Closed	NSR	.409 .....	NA
Alkyl acrylate-Vinyl pyridine copolymer in Toluene.	D	S	III	4m	PV	Restr	A	.409 .....	NA
Alkylaryl phosphate mixtures (more than 40% Diphenyl tolyl phosphate, less than 0.02% ortho-isomer).	A	S/P	I	B/3	PV	Closed	A, B, C	.316, .408, .525, .526, .1020 .....	NA
Alkyl(C3–C4)benzenes ( <i>all isomers</i> ) .....	A	P	III	4m	PV	Restr	A	.409 .....	I-D
Alkyl(C5–C8)benzenes ( <i>all isomers</i> ) .....	A	P	II	NR	Open	Open	A	.409 .....	I-D
Alkyldiene, Alkyldane, Alkyldiene mixture (each C12–C17).	A	P	II	NR	Open	Open	A, B	.440, .908(a) .....	NA
Alkylbenzenesulfonic acid ( <i>greater than 4%</i> ).	C	S/P	III	NR	Open	Open			NA

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Cargo name	IMO Annex II Pollution Category	IMO Annex II Haz. Cat.	Cargo contain-ment system	Vent height	Vent	Gauge	Special requirements in 46 CFR Part 153			Electrical hazard class and group
							a.	b.	c.	
Alkylbenzenesulfonic acid, sodium salt solution.	C	P	III	NR	Open	NSR	.440, .903, .908(a), (b) .....			NA
Alkyl(C7-C9) nitrates phenol poly(4-12)	B	S/P P	II	NR	Open	A, B	.409, .560, .1002 .....			NA
Alkyl (C7-C11) ethoxylate.	B	P	III	NR	Open	A	.409, .440, .488, .908(a), (b) .....			I-D
Alkyl(C8-C9) phenylamine in aromatic solvent.	A	P	III	4m	Pv	Restr	A			NA
Alkyl(C10-C20), saturated and unsaturated, phosphite.	C	P	III	NR	Open	A	None .....			NA
Alkyl(C8-C10) polyglucoside solution (65% or less).	C	P	III	NR	Open	NSR	.440, .908(a), (b) .....			NA
Alkyl(C12-C14) polyglucoside solution (55% or less).	B	P	III	NR	Open	NSR	.409, .440, .908(a), (b) .....			NA
Alkyl(C8-C10)(C12-C14); (40% or less/ 60% or more) polyglucoside solution (55% or less).	B	P	III	NR	Open	NSR	.409, .440, .908(a), (b) .....			NA
Alkyl(C8-C10)(C12-C14); (50/50%) polyglucoside solution (55% or less).	C	P	III	NR	Open	NSR	.440, .908(a), (b) .....			NA
Alkyl(C8-C10)(C12-C14); (60% or more/ 40% or less) polyglucoside solution (55% or less).	C	P	III	NR	Open	NSR	.440, .908(a), (b) .....			NA
Allyl alcohol .....	B	S/P	II	B/3	Pv	Closed	A	316, .408, .525, .526, .527, .933, .1020 .....		I-C
Allyl chloride .....	B	S/P	II	B/3	Pv	Closed	A	.316, .408, .525, .526, .527, .1020 .....		I-D
Aluminum chloride (30% or less). Hydro-chloric acid (20% or less) solution.	D	S	III	NR	NSR	Restr		.252, .526, .527, .554, .557, .933, .1045, .1052 .....		I-B
2-(2-Aminoethoxy) ethanol .....	D	S	III	NR	Open	A, C, D	.236(b), (c), .409 .....			NA
Aminoethyl ethanolamine .....	D	S	III	NR	Open	A	.236(a), (b), (o), (g) .....			NA
N-Aminomethylpiperazine .....	D	S	III	4m	Pv	A	.236(b), (c), .409, .526 .....			I-C
2-Amino-2-methyl-1-propanol (90% or less).	D	S	III	NR	Open	A	.236(a), (b), (o), (g) .....			I-D
Ammonia aqueous (28% or less), see Ammonium hydroxide (28% or less NH <sub>3</sub> ).				4m	Pv	Restr		.238(e), .526, .933, .1002 .....		NA
Ammonium bisulfite solution (70% or less)	D	S	III	4m	Pv	Restr		.236(b), (c), (f), .526, .527 .....		I-D
Ammonium hydroxide (28% or less NH <sub>3</sub> )	C	S/P	II	NR	Open	C		.238(d), .252, .336, .409, .554(a), (b) .....		NA
Ammonium nitrate solution (greater than 45% and less than 93%).	D	S	II	B/3	Pv	Open	A, C	.236(a), (b), (c), (g), .316, .408, .525, .526, .527, .933, .1002, .1020, .....		I-D
Ammonium sulfide solution (45% or less)	B	S/P	II	NR	Open	NSR	None .....			NA
Ammonium thiocyanate (25% or less), Ammonium thiosulfate (20% or less) solution.	C	P	III							

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Cargo name	IMO Annex II Pollution Category	Annex II Haz.	Cargo contain- ment system	Vent height	Vent	Gauge	Fire pro- tection system	Special requirements in 46 CFR Part 153		Electrical hazard class and group
								a.	b.	
Calcium hypochlorite solution (15% or less).	C	S/P	III	4m	Pv	Restr	NSR	.236(a), (b) ....	.....	NA
Calcium hypochlorite solution (more than 15%).	B	S/P	III	4m	Pv	Restr	NSR	.236(a), (b), .409 ....	.....	NA
Calcium long chain alkyl(C5-C10) phenate.	C	P	III	NR	Open	A, B	Open	None .....	.....	NA
Calcium long chain alkyl salicylate (C13+).	C	B	S/P	4m	Pv	Restr	A, B	(.440, .903, .908(a)) <sup>1</sup> .....	.....	NA
Camphor oil .....	A	S/P	II	B/3	Pv	Closed	C	.408, .440, .525, .526, .908(b), .933, .1020 .....	.....	I-D
Carbolic oil .....	B	S/P	II	B/3	Pv	Closed	C	.236(c), .252, .408, .500, .515, .520, .525, .526, .527, .1020, .1040 .....	.....	NA
Carbon disulfide .....	B	S/P	III	B/3	Pv	Closed	NSR	.316, .409, .525, .526, .527, .1020 .....	.....	NA
Carbon tetrachloride .....	D	S	III	4m	Pv	Restr	A, B	.526, .933 .....	.....	NA
Cashew nut shell oil (unterated) .....	C	S/P	III	NR	Open	NSR	Open	.236(a), (c), (g), .933 .....	.....	NA
Caustic potash solution .....	C	S	III	NR	Open	NSR	Open	.236(a), (c), (g), .933 .....	.....	NA
Caustic soda solution .....	D	S	III	NR	Open	NSR	Open	.912(a)(1), .102(c)(1), (b), .1004 .....	.....	NA
Cetyl-Eicosyl methacrylate mixture .....	D	S	III	NR	Open	NSR	Open	.316, .409, .440, .554, .908(b) .....	.....	I-D
Chlorinated paraffins (C10-C13) .....	A	P	III	NR	Open	NSR	Open	.238(e), .408, .440, .556 .....	.....	LD
Chloroacetic acid (80% or less)	C	S/P	III	B/3	Pv	Closed	A, B	.409, .526 .....	.....	NA
Chlorobenzene .....	B	S/P	III	B/3	Pv	Restr	NSR	.409, .525, .526, .527, .1020 .....	.....	I-D
Chloroform .....	B	S/P	III	B/3	Pv	Closed	A, C, D	.408, .525, .526, .1020 .....	.....	NA
(crude) Chlorhydrins .....	D	S	III	NR	Open	NSR	Open	.236(a), (b), (d), (g) .....	.....	I-D
4-Chloro-2-methylphenoxycetic acid, di-methylene salt solution.	C	P	III	NR	Open	NSR	Open	.316, .336, .408, .440, .525, .526, .908(a), (b), .933, .1020 .....	.....	NA
o-Chloronitrobenzene .....	B	S/P	II	B/3	Pv	Closed	A, B, C, D	.409, .440, .488, .908(a), (b) .....	.....	NA
1-(4-Chlorophenyl)-4,4-dimethyl pentan-3-one.	B	P	III	NR	Open	Open	A, B, D	.238(a), (b), .440, .554, .908(a), (b) .....	.....	NA
2- or 3-Chloropropionic acid .....	C	S/P	III	B/3	Pv	Closed	NSR	.408, .525, .526, .1045, .1056 .....	.....	I-B
Chlorosulfonic acid .....	C	S/P	III	4m	Pv	Restr	A, B, C	.409, .526 .....	.....	I-D
o-Chlorotoluene .....	A	S/P	III	4m	Pv	Restr	A, B, C	.409, .526 .....	.....	I-D
m-Chlorotoluene .....	B	S/P	III	4m	Pv	Restr	A, B, C	.409, .526 .....	.....	I-D
p-Chlorotoluene .....	B	S/P	III	4m	Pv	Restr	B, D	.409, .526 .....	.....	I-D
Chlorotoluenes (mixed isomers) .....	A	S/P	III	4m	Pv	Restr	A, D	.409, .526 .....	.....	I-D
Coal tar .....	A	S/P	III	4m	Pv	Restr	B, D	.252, .409, .933, .1060 .....	.....	I-D
Coal tar naphtha solvent .....	B	S	III	4m	Pv	Restr	A, D	.409, .526 .....	.....	I-D
Coal tar pitch (molten) .....	D	S	III	4m	Pv	Restr	A	.440, .903, .908(a), (b) .....	.....	NA
Cobalt naphthenate in solvent naphtha .....	A	S/P	III	NR	Open	Open	A, B, D	.409, .903, .908(a), (b) .....	.....	I-D
Coconut oil, fatty acid .....	[C]	P	III	NR	Open	Open	A, B, D	.409, .903, .908(a), (b) .....	.....	NA
Creosote oil, fatty acid .....	A	S/P	III	NR	Open	Open	A, B, D	.409, .903, .908(a), (b) .....	.....	I-D
Creosote (coal tar) .....	A	A	III	NR	Open	Open	A, B, D	.409, .903, .908(a), (b) .....	.....	NA
Creosote (wood) .....									.....	NA

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Cargo name	IMO Annex II Pollution Category	IMO Haz. Cat.	Cargo contain-ment system	Vent height	Vent	Gauge	Fire pro-tection system	Special requirements in 46 CFR Part 153		Electrical hazard class and group
								a.	b.	
2,4-Dichlorophenoxyacetic acid, dimethyl-amine salt solution.	A	S/P	III	NR	Open	Open	NSR	.236(a), (b), (c), (g), .409 .....	.....	NA
2,4-Dichlorophenoxyacetic acid, triisopropylolamine salt solution.	A	S/P	III	NR	Open	Open	NSR	.236(a), (b), (c), (g), .409 .....	.....	NA
1,1-Dichloropropane .....	C	S/P	II	B/3	P/V	Restr	A, B	.409, .525, .526, .1020 .....	.....	-D
1,2-Dichloropropane .....	C	S/P	II	B/3	P/V	Restr	A, B	.409, .525, .526, .1020 .....	.....	-D
1,3-Dichloropropane .....	D	S	II	B/3	P/V	Restr	A, B	.409, .525, .526, .1020 .....	.....	-D
1,3-Dichloropropane .....	B	S/P	II	B/3	P/V	Closed	A, B, C,	.316, .336, .408, .525, .527, .1020 .....	.....	-D
Dichloropropane, Dichloropropane mix-tures.	B	S/P	II	B/3	P/V	Closed	A, B, C, D	.316, .336, .408, .526, .527 .....	.....	-D
2,2-Dichloropropionic acid .....	D	S	III	4m	P/V	Restr	A	.238(e), .266, .500, .501, .554, .933 .....	.....	NA
Diethanolamine .....	D	S	III	NR	Open	Open	A	.236(b), (c) .....	.....	NA
Diethylamine .....	C	S/P	III	B/3	P/V	Restr	A	.236(a), (b), (c), (g), .409, .525, .526, .527, .1020 .....	.....	I-C
Diethylaminopropano, see										
Diethylaminoethanol, Diethylaminoethanoline	C	S/P	III	NR	Open	Open	B, C, D	.236(b), .409, .440, .908(b) .....	.....	NA
Diethylbenzene .....	A	P	III	4m	P/V	Restr	A	.409 .....	.....	-D
Diethyleneetriamine .....	D	S	III	NR	Open	Open	A	.236(b), (c) .....	.....	NA
Diethylethanolamine .....	C	S/P	III	4m	P/V	Restr	A, C	.236(a), (b), (c), (g), .409, .526 .....	.....	I-C
Diethyl ether, see Ethyl ether										
Di-(2-ethylhexyl) phosphoric acid .....	C	S/P	III	NR	Open	Open	A, B, C, D	.236(b), (c) .....	.....	-D
Diethyl phthalate .....	C	P	III	NR	Open	Open	A, D	None .....	.....	-D
Diethyl sulfate .....	B	S/P	II	4m	P/V	Closed	A, D	.236(a), (c), (d), .409, .526, .933 .....	.....	-D
Diglycidyl ether of Bisphenol A .....	B	P	III	NR	Open	Open	A, A	.409, .440, .908(a) .....	.....	NA
Diglycidyl ether of Bisphenol F .....	B	P	III	NR	Open	Open	A, A	.409, .440, .908(a) .....	.....	NA
Di-n-hexyl adipate .....	B	P	III	NR	Open	Open	A, B, C, D	.236(a), (b), (c), (d), (e), .526, .1020 .....	.....	NA
Disobutylamine .....	C	S/P	II	4m	P/V	Restr	A	None .....	.....	I-C
Disobutylcarbinol .....	@C	P	III	NR	Open	Open	A	.409 .....	.....	-D
Disobutylene .....	B	P	III	4m	P/V	Restr	A	.409, .440, .908(a) .....	.....	-D
Disobutyl phthalate .....	B	P	III	NR	Open	Open	A	.236(b), (c) .....	.....	-D
Disopropanolamine .....	C	S/P	II	B/3	P/V	Closed	A	.236(b), (c), .408, .525, .526, .1020 .....	.....	I-C
Disopropylamine .....	C	S/P	II	NR	Open	Open	A	.409 .....	.....	-D
Disopropylbenzene (all isomers) .....	A	P	II	B/3	P/V	Restr	B	.236(b), .316, .525, .526, .1020 .....	.....	I-D
N,N-Dimethylacetamide solution (40% or less).	D	S	III	B/3	P/V	Restr	B	.236(b), .316, .526 .....	.....	I-D
Dimethyl adipate .....	B	P	III	NR	Open	Open	A	.409, .440, .908(b) .....	.....	NA
Dimethylamine solution (45% or less) .....	C	S/P	III	B/3	P/V	Closed	A, C, D	.236(a), (b), (c), (g), .409, .525, .526, .527, .1020 .....	.....	I-C
Dimethylamine solution (over 45% but not over 55%),	C	S/P	II							

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C	[C]	S/P	PV	Closed	A, C, D	Open	B, C, D	I-C
	2,6-Dimethylaniline	S/P	NR	Open	A, C	Restr	A, C	-D
	N,N-Dimethylcyclohexylamine	S/P	B/3	Open	B	Open	B	NA
	N,N-Dimethyldodecylamine	S	NR	Open	A	Restr	A, D	NA
	Dimethylformamide	D	4m	Open	A	Restr	A, D	I-C
	Dimethyl glutarate	S	PV	Open	A	Open	A	-D
	Dimethyl hydrogen phosphite	P	NR	Open	A	Restr	A, D	NA
	Dimethyl naphthalene sulfonic acid, sodium salt solution	S/P	4m	Open	A	Open	NSR	NA
	[A]	P	NR	Open	A	Open	None	NA
	Dimethyloctanoic acid	C	P	NR	A	Open	None	I-D
	Dimethyl phthalate	C	P	NR	A	Open	None	-D
	Dimethyl succinate	C	P	NR	A	Open	None	NA
	Dinitrotoluene (molten)	S/P	B/3	PV	A	Closed	A	I-C
	1,4-Dioxane	D	4m	PV	A	Closed	A	-D
	Dipentene	S	PV	4m	Restr	A	Restr	I-D
	Diphenyl	P	NR	NR	A	Open	A	I-D
	Diphenylamine (molten)	C	P	NR	A	Open	None	NA
	Diphenylamines, alkylated	A	P	NR	A	Open	None	NA
	Diphenylamine, reaction product with 2,2,4-Trimethylpentene.	P	NR	NR	A	Open	None	NA
	Diphenyl Dihenyl ether mixtures	S/P	PV	NR	Open	Open	None	I-D
	Diphenyl ether	A	P	NR	A	Open	None	-D
	Biphenyl phenyl ether mixture.	A	P	NR	A	Open	None	NA
	Diphenylmethane diisocyanate <sup>6</sup>	B	S/P	B/3	PV	Closed	A, B, C <sup>6</sup> , D	NA
	Diphenylol propane-epichlorohydrin resins	P	III	NR	Open	Open	B, D	NA
	Dithiocarbamate ester (C7-C35)	S/P	4m	PV	Restr	Restr	.602, .908(a), .1000, .1020,	NA
	Dodecanol	A	III	NR	Open	Open	.409, .440, .908(a)	I-C
	Dodecene (all isomers)	P	III	NR	Open	Open	.526, .1020	NA
	Dodecene alcohol, see Dodecanol.	B	III	NR	Open	Open	.409, .440, .488, .908(a), (b)	-D
	Dodecyldiamine, Tetradecylamine mixture ..	B	III	4m	PV	Restr	.409, .440, .488, .908(a), (b)	I-D
	Dodecyldimethylamine.	A	III	NR	Open	Open	.409, .440, .488, .908(a), (b)	NA
	Tetradecyldimethylamine mixture.	A	III	NR	Open	Open	.409, .440, .488, .908(a), (b)	NA
	Dodecyl diphenyl ether disulfonate solu-	A	S/P	II	NR	Open	NSR	NA
	tion.							
	Dodecyl hydroxypropyl sulfide ..	A	P	-	NR	Open	A	I-D
	Dodecyl methacrylate ..	S	S	III	NR	Open	A, C	NA
	Dodecyl-Octadecyl methacrylate mixture ..	D	S	III	NR	Open	Restr	NA
	Dodecyl-Pentaadecyl methacrylate mixture ..	S	S	-	NR	Open	A, D	NA
	Dodecyl phenol ..	A	P	-	NR	Open	A, C, D	I-C
	Drilling brine (containing Zinc salts)	B	S/P	B/3	PV	Open	NSR	NA
	Epichlorohydrin ..	A	S	III	NR	Closed	A	-D
	Ethanolamine ..	D	S	III	NR	Open	Open	I-C
	2-Ethoxyethyl acetate ..	C	S/P	III	PV	Restr	A	I-C
	Ethyl acrylate ..	A	S/P	III	PV	Restr	A	-D
	Ethylenamine ..	C	C	III	PV	Closed	C, D	I-D

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Cargo name	IMO Annex II Pollution Category	IMO Annex II Haz. Cat.	Cargo contain-ment system	Vent height	Vent	Gauge	Fire pro-tection system	Special requirements in 46 CFR Part 153		Electrical hazard class and group
								a.	b.	
Ethylamine solution (72% or less) .....	C	S/P	II	B/3	Pv	Closed	A, C	.236(a), (b), (c), (g), .372, .408, .525(a), (c), (d), (e), .526, .527, .1020, .409 .....	I-D	
Ethyl amyl ketone .....	C	P	III	4m	Pv	Restr	A	.409 .....	I-D	
Ethybenzene .....	B	P	III	4m	Pv	Restr	A	.236(a), (b), (c), (g), .409, .525(a), (c), (d), (e), .526, .1020 .....	I-C	
N-Ethylbutylamine .....	C	S/P	III	4m	Pv	Restr	A	.409 .....	I-C	
Ethyl tert-butyl ether .....	C	P	III	4m	Pv	Restr	A	.409 .....	I-D	
Ethyl butyrate .....	C	P	III	4m	Pv	Restr	A	.409 .....	I-D	
Ethylcyclohexane .....	C	P	III	4m	Pv	Restr	A	.409 .....	I-C	
N-Ethylcyclohexylamine .....	D	S	III	4m	Pv	Restr	A	.236(a), (b), (c), (g), .409, .526 .....	I-D	
S-Ethyl diisopropylcarbamate .....	C	P	III	NR	Pv	Open	A	None .....	NA	
Ethylene chlorohydrin .....	D	S	III	B/3	Pv	Closed	A, D	.316, .408, .525, .526, .527, .933, .1020 .....	I-D	
Ethylene cyanohydrin .....	D	S	III	NR	Pv	Open	A	None .....	NA	
Ethylenediamine .....	C	S/P	III	4m	Pv	Restr	A	.236(b), (c), .409, .440, .526, .908(b) .....	I-D	
Ethylene dibromide .....	C	S/P	III	B/3	Pv	Closed	NSR	.408, .440, .525, .526, .527, .908(b), .1020 .....	NA	
Ethylene dichloride .....	B	S/P	III	4m	Pv	Restr	A, B	.236(b), .408, .526 .....	I-D	
Ethylene glycol butyl ether acetate .....	C	P	III	NR	Pv	Open	A	None .....	I-C	
Ethylene glycol diacetate .....	C	P	III	NR	Pv	Open	A	None .....	I-D	
Ethylene glycol ethyl ether acetate, see 2- Ethoxylethyl acetate .....	C	P	III	NR	Pv	Open	A	None .....	I-C	
Ethylene glycol methyl ether acetate .....	C	P	III	NR	Pv	Open	A	None .....	I-C	
Ethylene glycol monooxyethyl ether .....	D	S	III	4m	Pv	Restr	A	None .....	I-C	
Including:										
2-Ethoxyethanol .....										
Ethylene glycol butyl ether .....										
Ethylene glycol tert-butyl ether .....										
Ethylene glycol ethyl ether .....										
Ethylene glycol methyl ether .....										
Ethylene glycol n-propyl ether .....										
Ethylene glycol isopropyl ether .....										
Ethylene oxide (30% or less), Propylene oxide mixture, (30%) .....	C	S/P	II	B/3	Pv	Closed	A, C	.252, .372, .408, .440, .500, .525, .526, .530, .1010, .1011, .1020, .409 .....	I-B	
Ethyl ether .....	III	S	II	4m	Pv	Closed	A	.256(g), .252, .372, .408, .440, .500, .515, .526, .527 .....	I-C	
Ethyl-3-ethoxypropionate .....	C	P	III	4m	Pv	Restr	A	None .....	NA	
@C										
2-Ethylhexanol .....	B	S/P	III	NR	Pv	Open	A	.409, .912(a)(1), .1002(a), (b), .1004 .....	I-D	
2-Ethylhexyl acrylate .....	B	S/P	III	B/3	Pv	Restr	A	.236(b), (c), .409, .525, .526, .1020 .....	I-D	
2-Ethylhexylamine .....	B	P	III	NR	Pv	Open	A	None .....	NA	
Ethyl hexyl phthalate .....	C	S/P	III	B/3	Pv	Restr	A, B, C,	.236(b), .409, .526 .....	I-C	
Ethyldiene norbornene .....	B	S	III	4m	Pv	Restr	A, B, D	.409, .526, .912(a)(1), .1002(a), (b), .1004 .....	I-D	
Ethyl methacrylate .....	D	S	III	4m	Pv	Restr				

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Ethylophenol .....	A	NR	Open	B	409 .....	I-D
2-Ethyl-3-propylacrolein .....	A	PV	Restr	A	.409, .526 .....	I-C
Ethyl toluene .....	B	PV	Restr	A	.409 .....	-D
Ferric chloride solutions .....	C	NR	Open	NSR	.....	I-B
Ferric nitrate, Nitric acid solution .....	C	4m	PV	NSR	.....	I-B
Fluorosilicic acid (30% or less) .....	C	4m	PV	NSR	.....	I-B
Formaldehyde (50% or more), Methanol mixtures, .....	C	B/3	PV	NSR	.....	I-B
Formaldehyde solution (37% to 50%) .....	#	4m	PV	Closed	.....	I-B
Formic acid .....	C	4m	PV	Restr	.....	I-B
Fumaric adduct of rosin, water dispersion .....	D	NR	PV	Restr	.....	I-D
Furfural .....	C	NR	Open	NSR	.....	NA
Furfuryl alcohol .....	C	NR	PV	Restr	.....	I-C
Glutaraldehyde solution (50% or less) .....	D	NR	Open	Open	.....	I-C
Glycidyl ester of C10 Trialkyl acetic acid, see Glycidyl ester of Tridecy acetic acid. ....			NR	NR	.....	NA
Glycidyl ester of Trideoyl acetic acid .....	B	P	Open	A	409 .....	NA
Glyoxylic acid solution (50% or less) .....	D	S	Open	A	409 .....	NA
Heptane (all isomers), see Alkanes(C6-C9) (all isomers). ....	C	P	Open	A	409 .....	I-D
Heptanol (all isomers) .....	C	P	Open	A	409 .....	I-D
Heptene (all isomers) .....	C	P	Open	A	409 .....	I-D
Heptyl acetate .....	B	SIP	Open	A	409 .....	I-D
Hexamethylenediamine (molten) .....	C	4m	PV	Open	.....	NA
Hexamethylene diamine solution .....	C	SIP	4m	PV	.....	NA
Hexamethylene diisocyanate <sup>6</sup> , .....	B	SIP	B/3	PV	.....	NA
Hexamethyleneimine .....	C	SIP	=	4m	PV	.....
Hexane (all isomers), see Alkanes(C6-C9). ....	C	P	=	4m	PV	.....
Hexene (all isomers) .....	C	P	=	4m	PV	.....
Hexy acetate .....	D	S	=	4m	PV	.....
Hydrochloric acid .....	C	SIP	=	B/3	PV	.....
Hydrogen peroxide solutions (over 8% but not over 60%). ....	C	SIP	=	B/3	PV	.....
Hydrogen peroxide solutions (over 60% but not over 70%). ....	C	SIP	=	B/3	PV	.....
2-Hydroxyethyl acrylate .....	B	P	=	4m	PV	.....
N,N-bis(2-hydroxyethyl) oleamide .....	B	P	=	NR	Open	.....
2-Hydroxy-4-(methylthio)butanoic acid .....	C	P	=	NR	Open	.....
Hydroxyteradeca(oxytetra methylene), see Poly(tetramethylene ether) glycols (mw 950-1050). ....	B	P	III	NR	Open	NA
Icosa (oxypropane-2,3-diy)s .....	B	P	III	4m	PV	NA
Isophorone diamine .....	D	S	III			NA

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Cargo name	IMO Annex II Pollution Category	Haz. Cat.	Cargo contain-ment system	Vent height	Vent	Gauge	Fire pro-tection system	Special requirements in 46 CFR Part 153		Electrical hazard class and group
								a.	b.	
Isophorone diisocyanate <sup>6</sup>	B	S/P	II	B/3	P/V	Closed	A, B, C, D, E, B	.236(a), (b), .316, .409, .500, .501, .525, .526, .602, .1000, .1020, .372, .409, .440, .912(a)(1), .1002(a), (b), .1004	.....	NA
Isoprene .....	C	S/P	III	4m	P/V	Restr	.....	.....	.....	I-D
(Isopropylbenzene, see Propylbenzene (all isomers))										
Lactonitrile solution (80% or less) .....	B	S/P	II	B/3	P/V	Closed	A, C, D	.238(d), .252, .316, .336, .408, .440, .525, .526, .527, .908(a), .912(a)(2), .1002, .1004, .1020, .1035,	.....	I-D
Lauric acid .....	B	P	III	NR	Open	A	.....	.....	.....	NA
Lauryl polyglucose (50% or less), see Alkyl(C12-C14) polyglucoside solution (55% or less).										
Long chain alkaryl polyether (C11-C20) .....	C	P	III	NR	Open	A, B	.....	.....	.....	NA
Long chain polyetheramine in alkyl(C2-C4)benzenes.	C	P	III	4m	P/V	Restr	.....	.....	.....	I-D
Magnesium long chain alkyl salicylate (C11+), Maleic anhydride <sup>7</sup>	C	P	III	NR	Open	A, B	.....	.....	.....	NA
.....	D	S	III	4m	P/V	Restr	.....	.....	.....	NA
.....										
Mercaptobenzothiazol, sodium salt solu-tion, see Sodium-2-mercaptobenzothiazol solution	D	S	III	4m	P/V	Restr	A	.236(b), (c), .409, .526, .527, .908(a)(1), .1002(a), (b), .1004	.....	I-D
Mesityl oxide .....	A	S/P	III	NR	Open	NSR	A	.236(a), (b), (c), (g), .409, .526, .912(a)(1), .1002(a), (b), .1004	.....	NA
Methyl sodium solution .....	D	S	III	4m	P/V	Restr	A	.236(b), .408, .440, .526, .908(a)	.....	NA
Methacrylic acid .....	B	S/P	III	4m	P/V	Restr	A	.236(b), .408, .440, .526, .908(a)	.....	I-D
Methacrylic resin in Ethylene dichloride .....	D	S	III	B/3	P/V	Closed	A	.236(b), .408, .526, .908(a)	.....	NA
Methacrylonitrile .....	D	S	III							
N-(2-Methoxy-1-methyl ethyl)-2-ethyl-6-methyl chloroacetanilide, see Metolachlor										
Methyl acrylate .....	B	S/P	II	4m	P/V	Restr	A, B	.409, .526, .527, .912(a)(1), .1002(a), (b), .1004	.....	I-D
Methylamine solution (42% or less) .....	C	S/P	III	B/3	P/V	Closed	A, C, D	.236(a), (b), (c), (g), .316, .408, .525, .526, .527, .1020	.....	I-D
Methylamyl acetate .....	C	P	III	4m	P/V	Restr	A	.409	.....	I-D
Methylamyl alcohol .....	C	P	III	4m	P/V	Restr	A	.409	.....	I-D
Methyl butyrate .....	C	P	III	4m	P/V	Restr	A	.409	.....	I-D
Methylcyclohexane .....	C	P	III	4m	P/V	Restr	B	.409	.....	I-B
Methylcyclopentadiene dimer .....	B	S	III	NR	Open	A	.....	.....	.....	I-C
Methyl diethanolamine .....	D	S	III	NR	Open	A, B, C, D	None	.....	.....	NA
Methylene chloride, see Dichloromethane	C	S/P	III	NR	Open	A, D	.....	.....	.....	I-D
2-Methyl-6-ethylaniline .....	B	S/P	II	B/3	P/V	Restr	A	.236(b), .409, .527, .908(a)(1), .1002	.....	I-D
Methyl formate .....	D	S	II							

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2-Methyl-5-ethylpyridine .....	S/P	NR	Open Pv Pv Pv	A, D A	236(b), 409 .372, .408, .440, .525, .526, .527, .1020 .....
Methyl formate .....	S	B/3	Restr Restr Restr Restr	A, B, C, D	I-D I-D I-D I-D
Methyl heptyl ketone .....	P	4m	Pv Pv Pv	A, B, C, D	I-D
2-Methyl-2-hydroxy-3-butyne .....	P	4m	Pv Pv	A, B, C, D	I-D
Methyl methacrylate .....	D	S	4m	A, B, C, D	I-D
Methyl naphthalene (molten) .....	D	S/P	4m	A, B, C, D	I-D
2-Methyl-1-pentene (Hexene (all iso-mers)), see Alkanes(C6-C9). 4-Methyl-1-pentene (Hexene (all iso-mers)), see Alkanes(C6-C9).	D	S	4m	A, B, C, D	I-D
Methyl terpenyl ether, see tert-Amyl methyl ether.	C	S	4m	A, B, C, D	I-D
2-Methylpyridine .....	C	S	4m	A, B, C, D	I-D
4-Methylpyridine .....	D	S	4m	A, B, C, D	I-D
Methyl salicylate .....	B	P	NR	A, C	I-D
alpha-Methylstyrene .....	D	S/P	4m	A, D B, C	I-D
3-(Methylthio) propionaldehyde .....	B	S/P	B/3	A, C	I-D
Melilotachlor .....	B	S	NR	A, C	NA
Morpholine .....	D	S	4m	A, C	NA
Motor fuel anti-knock compounds (containing lead alkyls).	D	S/P	B/3	A, C	I-C
Naphthalene (molten) .....	A	S/P	4m	A, B, C	I-D
Naphthalene sulfonic acid, sodium salt solution (40% or less).	[A]	P	NR	A, B, C	I-D
Naphthenic acid .....	A	P	NR	A, B, C	I-D
Naphthenic acid, sodium salt solution .....	[A]	P	NR	A, B, C	I-D
Neodecanoic acid .....	C	P	NR	A, B, C	I-D
Nitration acid (mixture of sulfuric and nitric acids).	C	S/P	NR	A, B, C	I-D
Nitric acid (70% or less) .....	C	SP	4m	A, C, D 7A, C	I-B
Nitrobenzene .....	B	S/P	B/3	A, D 7A, C	I-B
Nitroethane 7 .....	D	S	4m	A, D 7A, C	I-C
Nitroethane, 1-Nitropropane (each 15% or more) mixture 7.	D	S	4m	A, D 7A, C	I-C
o-Nitrophenol (molten) .....	B	S/P	B/3	A, C, D 7A, C	I-C
1- or 2-Nitropropane 7 .....	D	S	4m	A, C, D 7A, C	I-C
Nitropropane (60%), Nitroethane (40%) mixture 7.	D	S	4m	A, C, D 7A, C	I-C
Nitropropane (20%), Nitroethane (80%) mixture 7.	D	S	4m	A, C, D 7A, C	I-C
(o-, p-) Nitrotoluene .....	B	S/P	B/3	A, B, C	I-D
Nonane (all isomers), see Alkanes(C6-C9). Nonene (all isomers) .....	C	P	4m	A, B, C	I-D
Nonyl acetate .....	C	P	NR	A, B, C	I-D
Nonyl alcohol (all isomers) .....	C	P	Open Open Open	A, B, C	I-D
Nonyl phenol .....	A	P	Open Open Open	A, B, C	I-D

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Cargo name	IMO Annex II Pollution Cat-egory	Haz.	Cargo contain-ment system	Vent height	Vent	Gauge	Fire pro-tection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
Nonyl phenol poly(4+)-ethoxylates a.	B b.	P c.	III d.	NR e.	Open f.	Open g.	A h.	.409, .440, .488 <sup>1</sup> , .908(a), (b) i.	I-D j.
Noxious liquid, N.F., (1) n.o.s. ("trade name", contains "principal components") ST 1, Cat A.	A	P	I	NR	Open	Open	A	.408	NA
Noxious liquid, F., (2) n.o.s. ("trade name", contains "principal components") ST 1, Cat A.	A	P	I	4m	PV	Restr	A	.408	NA
Noxious liquid, N.F., (3) n.o.s. ("trade name", contains "principal components") ST 2, Cat A.	A	P	II	NR	Open	Open	A	.409	NA
Noxious liquid, F., (4) n.o.s. ("trade name", contains "principal components") ST 2, Cat A.	A	P	II	4m	PV	Restr	A	.409	NA
Noxious liquid, N.F., (5) n.o.s. ("trade name", contains "principal components") ST 2, Cat B.	B	P	II	NR	Open	Open	A	.409; (.440, .908) <sup>1</sup>	NA
Noxious liquid, N.F., (6) n.o.s. ("trade name", contains "principal components") ST 2, Cat B, mp. equal to or greater than 15 deg. C.	B	P	II	NR	Open	Open	A	.409, .440, .488, .908(b); (.908(a)) <sup>1</sup>	NA
Noxious liquid, F., (7) n.o.s. ("trade name", contains "principal components") ST 2, Cat B.	B	P	II	4m	PV	Restr	A	.409; (.440, .908) <sup>1</sup>	NA
Noxious liquid, F., (8) n.o.s. ("trade name", contains "principal components") ST 2, Cat B, mp. equal to or greater than 15 deg. C.	B	P	II	4m	PV	Restr	A	.409, .440, .488, .908(b); (.908(a)) <sup>1</sup>	NA
Noxious liquid, N.F., (9) n.o.s. ("trade name", contains "principal components") ST 3, Cat A.	A	P	III	NR	Open	Open	A	.409	NA
Noxious liquid, F., (10) n.o.s. ("trade name", contains "principal components") ST 3, Cat A.	A	P	III	4m	PV	Restr	A	.409	NA

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Noxious liquid, F., (13) n.o.s. ("trade name" contains "principal components") ST 3, Cat B.	B	P	III	4m	PV	Restr	A	.409; (.440, .908) <sup>1</sup> .....	NA
Noxious liquid, F., (14) n.o.s. ("trade name" contains "principal components") ST 3, Cat B, mp. equal to or greater than 15 deg. C.	B	P	III	4m	PV	Restr	A	.409, .440, .488, .908(b); (.908(a)) <sup>1</sup> .....	NA
Noxious liquid, N.F., (15) n.o.s. ("trade name" contains "principal components") ST 3, Cat C.	C	P	III	NR	Open	A	(.440, .903, .908) <sup>1</sup> .....	NA	
Noxious liquid, F., (16) n.o.s. ("trade name" contains "principal components") ST 3, Cat C.	C	P	III	4m	PV	Restr	A	(.440, .903, .908) <sup>1</sup> .....	NA
Octane (all isomers), see Alkanes(C6-C9)	C	P	III	4m	PV	Restr	A	.409 .....	I-D
Octanol (all isomers)	C	P	III	4m	NR	Open	A	.409 .....	I-D
Octene (all isomers)	C	P	III	4m	NR	Restr	A	.409 .....	I-D
Octyl acetate	C	P	III	4m	PV	Open	A	.409 .....	I-C
Octyl aldehydes	B	P	III	4m	PV	Restr	A	.409 .....	I-C
Octyl nitrates (all isomers), see Alkyl(C7-C9) nitrates	B	P	III	4m	PV	Restr	A	.409 .....	I-D
Olefin mixtures (C5-C7)	C	P	III	4m	PV	Restr	A	.409 .....	I-D
Olefin mixtures (C5-C15)	C	B	III	4m	PV	Restr	A	.409 .....	I-D
alpha-Olefins (C6-C18) mixtures	B	P	III	4m	PV	Restr	A	.409 .....	I-D
Oleum	C	S/P	III	B/3	PV	Closed	NSR	.316, .408, .440, .526, .527, .554, .555, .556, .602, .908(a), .933, .1000, .1045, .1052, .909 .....	I-B
Oleyamine	A	S/P	III	4m	PV	Restr	A	.409, .526 .....	NA
Palmitic acid oil	C	P	III	4m	NR	Open	A, B	.440, .903, .908(a), (b) .....	NA
Paraldehyde	C	S/P	III	B/3	PV	Closed	NSR	.409, .440, .908(b) .....	I-C
Paraldehyde-ammonia reaction product	C	S/P	III	B/3	PV	Restr	A, B	.236, (a), (b), (c), (g), .525(a), (c), (e), .408, .526, .1020 .....	NA
Pentachloroethane	B	S/P	III	4m	PV	Restr	A, B	.316, .409, .525, .526, .912(a)(1), .1002, .1004 .....	I-D
1,3-Pentadiene	C	P	III	B/3	PV	Restr	A	.372, .409 .....	I-D
Pentane (all isomers)	C	P	III	B/3	Open	Closed	A, D	.238(a), .408, .525(a), (c), (e), .554, .933, .1020 .....	I-D
n-Pentanoic acid (64%)	D	S	III	4m	PV	Restr	A	.409 .....	I-D
n-Pentanoic acid (64%)	D	S	III	B/3	PV	Restr	A	.409 .....	I-D
Pentene (all isomers)	C	P	III	4m	PV	Restr	A	.409 .....	NA
n-Pentyl propionate	C	P	III	4m	PV	Restr	A	.409 .....	NA
Perchloroethylene	B	S/P	III	B/3	PV	Closed	NSR	.409, .526 .....	I-D
Phenol (or solutions with 5% or more Phenol).	C	S/P	III	NR	Open	A, B	.409 .....	NA	
1-Phenyl-1-xylyl ethane	C	P	III	4m	NR	Open	NSR	.554, .555, .556, .1045, .1052, .933 .....	I-B
Phosphate esters, alkyl(C12-C14)amine ..	D	P	III	4m	NR	Open	NSR	.440, .908(a), (b) .....	I-D
Phthalic anhydride (molten)	C	S/P	III	4m	PV	Restr	A, D	.409 .....	I-D
Pinene, see the alpha- or beta- isomers.	A	P	III	4m	PV	Restr	A	.409 .....	I-D
alpha-Phene	B	P	III	NR	Open	PV	Restr	.440, .908(a), (b) .....	I-D
beta-Phene	B	P	III	4m	NR	Open	Restr	.440, .903, .908(a) .....	NA
Pine oil	C	P	III	4m	PV	Open	A, D	.409 .....	NA
Polyalkylene oxide polyol	C	C	III	NR	PV	Open	Restr	.440, .903, .908(a) .....	I-D
Poly(2+)-cyclic aromatics	A	C	III	NR	PV	Open	Restr	.409 .....	NA

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Cargo name	IMO Annex II Pollution Category	Haz.	Cargo contain-ment system	Vent height	Vent	Gauge	Fire pro-tection system	Special requirements in 46 CFR Part 153		Electrical hazard class and group
								a.	b.	
Polyethylene polyamines .....	C	S/P	III	NR	Open	A	.236(b), (c), .400, .440, .908(b) .....			NA
Polymeric sulfate solution .....	C	S/P	III	NR	Open	NSR	.238(d) .....			NA
Polyisobuteneamine in aliphatic (C10-C14) solvent.	C	P	II	B/3	Pv	Closed	A, C 6, D	.236(a), (b), .409, .500, .501, .525, .526, .602, .1000, .1020 .....		NA
Polyethylene polyphenyl isocyanate 6 ...	D	S	II	NR	Open	A	.409, .440, .903, .908(a) .....			NA
Polyolefinamine (C28-C250) .....	C	P	III	NR	Open	Restr	A	(.440, .903, .908(a)) <sup>1</sup> .....		I-D
Polyolefinamine in alkyl(C2-C4)benzenes .....	C	P	III	4m	Pv	Open	A, B	.409, .440, .903, .908(a) .....		NA
Polyolefin phosphorusulfide, barium derivative (C28-C250).	C	P	III	NR	Open	Open	A, D	.409, .440, .488, .908(a), (b) .....		NA
Poly(tertbutylmethane ether) glycols (mw 950-1050).	B	P	III	NR	Open					
Potassium hydroxide solution, see Caus-tic potash solution										
Potassium oleate .....	C	P	III	NR	Open	Open	A	.409 .....		NA
Potassium thiosulfate (50% or less) .....	C	S/P	III	NR	Open	Open	NSR	None .....		NA
n-Propanolamine .....	C	S/P	III	NR	Open	Open	A, D	.236(b), (c), .440, .526, .903, .908(b) .....		-D
Propionaldehyde .....	C	S/P	III	4m	Pv	Open	A	.236(b), (c), .440, .526, .908(b) .....		NA
Propionic acid .....	D	S	III	4m	Pv	Restr	A	.316, .409, .536, .527 .....		I-C
Propionic anhydride .....	C	S/P	III	4m	Pv	Restr	A	.238(a), .409, .527, .554, .933 .....		I-D
Propionitrile .....	C	S/P	III	4m	Pv	Restr	A	.238(a), .526 .....		I-D
Iso-Propylamine .....	C	S/P	III	B/3	Pv	Closed	A, D	.252, .316, .336, .408, .525, .526, .527, .1020 .....		I-D
Iso-Propylamine solution (70% or less) .....	C	S/P	III	B/3	Pv	Closed	C, D	.236(b), (c), .372, .408, .440, .525, .526, .527, .1020 .....		I-D
n-Propylamine .....	C	S/P	III	B/3	Pv	Closed	C, D	.236(a), (b), (g), .408, .500, .525, .526, .527, .1020 .....		I-D
n-Propylbenzene, see Propylbenzene (all isomers).										
Propylbenzene (all isomers) .....	A	P	II	4m	Pv	Restr	A	.409 .....		I-D
n-Propyl chloride .....	D	S	III	4m	Pv	Restr	A, B	.409 .....		I-D
Iso-Propylcyclohexane .....	C	P	III	4m	Pv	Restr	A	.409 .....		I-D
Propylene dimer .....	C	S/P	III	B/3	Pv	Closed	A, C	.409 .....		NA
Propylene oxide .....	C	P	III	4m	Pv	Restr	A	.372, .408, .440, .500, .526, .530, .1010, .1011 .....		I-B
Propylene tetramer .....	B	P	III	4m	Pv	Restr	A	.409 .....		I-D
Propylene trimer .....	B	P	III	4m	Pv	Restr	A	.409 .....		I-D
Iso-Propyl ether .....	D	S	III	4m	Pv	Restr	A	.409, .500, .515, .912(a)(1) .....		I-D
Pyridine .....	D	S	III	NR	NR	Open	A	.236(b), .409 .....		I-D
Rosin, see Rosin oil.										
Rosin oil .....	B	P	III	NR	NR	Open	A	.409, .440, .488, .908(a), (b) .....		I-D
Rosin soap (disproportionated) solution .....	B	P	III	NR	NR	Open	A	.409 .....		NA
Sodium alkyl (C14-C17) sulfonates 60-65% solution, see Aikane (C14-C17)										

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Cargo name	IMO Annex II Pollution Category	Cargo Haz.	Containment system	Vent height	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153		Electrical hazard class and group
								a.	b.	c.
Tetrahydrofuran	D	S	III	4m	PV	Restr	A, D	.409, .526, .912(a)(2), .1004 .....	None .....	I-C
Tetrahydropthalene	C	P	III	NR	Open	Open	A	None .....	None .....	I-D
Tetramethylbenzene (all isomers)	A	P	III	4m	PV	Open	A	409 .....	None .....	I-D
Toluene	C	S/P	II	B/3	PV	Closed	A, B, C, D	.236(a), (b), (c), (g), .316, .408, .440, .525, .526, .527, .908(a), (b), .933, .1020 .....	None .....	NA
Toluenediamine	C	S/P	II	4m	PV	Closed	A, C <sup>6</sup> , D	.236(b), .316, .408, .440, .500, .501, .525, .526, .527, .602, .908(b), .1000, .1020 .....	None .....	I-D
Toluene diisocyanate <sup>6</sup>	C	S/P	II	B/3	PV	Closed	A, C	.316, .408, .525, .526, .933, .1020 .....	None .....	I-D
o-Tolidine	C	S/P	II	NR	Open	Open	A	.409 .....	None .....	I-D
Tributyl phosphate	B	P	II	B/3	PV	Closed	A, C, D	.316, .408, .440, .526, .908(b), .933 .....	None .....	I-D
1,2,3-Trichlorobenzene (molten)	A	S/P	II	=	4m	Restr	A, B, C,	.409, .440, .526, .908(b), .933 .....	None .....	I-D
1,2,4-Trichlorobenzene	B	S/P	II	NR	Open	Open	A	.409 .....	None .....	I-D
1,1,1-Trichloroethane	C	P	III	B/3	PV	Restr	NSR	.409 .....	None .....	I-D
1,1,2-Trichloroethane	C	S/P	II	B/3	PV	Restr	NSR	.316, .409, .525, .526, .933, .1020 .....	None .....	I-D
Trichloroethylene	C	S/P	II	B/3	PV	Closed	A, B, C, D	.316, .408, .525, .526, .933, .1020 .....	None .....	I-D
1,2,3-Trichloropropane	C	S/P	II	NR	Open	Open	A	.316, .408, .525, .526, .933, .1020 .....	None .....	I-D
1,1,2-Trichloro-1,2,2-trifluoroethane	C	P	III	NR	Open	Open	A	.409 .....	None .....	NA
Tricresyl phosphate (less than 1% of the ortho isomer).	A	P	II	4m	PV	Closed	A, B	.408, .525(a), (c), (d), (e), .1020 .....	None .....	I-D
Tricresyl phosphate (1% or more of the ortho isomer).	A	S/P	-	NR	Open	Open	A	.409 .....	None .....	NA
Tridecanoic acid	B	P	III	NR	Open	Open	A	.409, .440, .488, .908(a), (b) .....	None .....	NA
Triethanolamine	D	S	III	B/3	PV	Restr	A, B, C	.236(a), (b), (g), .236(b), (c), .409, .525, .526, .527, .1020 .....	None .....	I-C
Triethylamine	C	S/P	II	NR	Open	Open	A	.409 .....	None .....	I-C
Triethylbenzene	A	P	III	NR	Open	Open	A	.236(a), (b), (g), .236(b), (c), .409, .525, .526, .527, .1020 .....	None .....	I-D
Triethylene glycol di-(2-ethylbutyrate)	[C]	D	S	III	NR	Open	A	.236(a), (b), (g), .236(b), (c), .409, .525, .526, .527, .1020 .....	None .....	I-C
Trimethylenetetramine	D	S/P	II	B/3	PV	Restr	A, B, D	.409 .....	None .....	NA
Triethyl phosphite	B	P	III	NR	Open	Open	A	.409 .....	None .....	NA
Triisopropylated phenyl phosphates	D	S	III	4m	PV	Restr	A, C	.238(a), .266, .554, .238(a), (b), (g), .372, .408, .440, .525, .526, .527, .908(b), .1020 .....	None .....	I-D
Trimethylacetic acid	D	S/P	II	B/3	PV	Closed	A, C	.236(a), (b), (g), .236(b), (c), .409, .525, .526, .527, .1020 .....	None .....	I-C
Trimethylaminium solution (30% or less)	C	S/P	II	4m	PV	Restr	A	.409 .....	None .....	I-D
Trimethylbenzene (all isomers)	A	P	III	NR	Open	Open	A, C	.236(a), (b), (g), .409 .....	None .....	NA
Trimethylhexanymethylenediamine (2,2,4- and 2,4,4-isomers).	D	S	III	B/3	PV	Closed	A, C <sup>6</sup>	.316, .409, .500, .501, .525, .602, .1000, .1020 .....	None .....	NA
Trimethylhexanymethylene diisocyanate (2,2,4- and 2,4,4-isomers) <sup>6</sup> .	B	S/P	II	NR	Open	Open	A	.409 .....	None .....	I-D
2,2,4-Trimethyl-1,3-pentanediol-1-isobutrate.	C	P	III	4m	PV	Restr	A, D	.409, .526, .602, .1000 .....	None .....	I-D
Trimethyl phosphite	#	S	III	S	PV	Restr	A, D	.409 .....	None .....	I-C
1,3,5-Trioxane	D									

Trixylphenyl phosphate	I	P	NR	Open	A	.408	.....	NA
Trixylphenyl phosphate, see Trixylphenyl phosphate.								
Turpentine	B	P	4m	PV	Restr	A	.409	.....
Undecanoic acid	B	P	NR	Open	Open	A	.440	.908(a), (b)
1-Undecene	B	P	NR	Open	Open	A	.409	.....
7-Undecyl alcohol	B	P	NR	Open	Open	A	.409	.....
Urea, Ammonium nitrate solution (containing more than 2% NH <sub>3</sub> )	C	S/P	4m	PV	Restr	A	.236(b), .526	.....
Valeraldehyde (all isomers)	C	S/P	4m	PV	Restr	A	.409	.500, .526
Vinyl acetate	C	S/P	4m	PV	Restr	A	.409	.912(a)(1), .1002(a), (b), .1004
Vinyl ethyl ether	C	S/P	4m	PV	Closed	A	.236(b), (d), (f), (g), .252, .372, .408, .440, .500, .515,	
Vinyldene chloride	D	S	II	PV	Restr	B	.526, .527, .912(a)(1), .1002(a), (b), .1004,	
Vinyl neodecanoate	B	S/P	III	NR	Open	A, B	.236(a), (b), .372, .409, .440, .500, .526, .527,	
Vinytoluene	A	S/P	III	NR	Open	A, B, D	.409, .912(a)(1), .1002(a), (b), .1004	
White spirit (low (15–20%) aromatic)	B	P	II	PV	Restr	A	.236(a), (b), (c), (g), .409, .912(a)(1), .1002(a), (b), .1004	
Xylenes (ortho-, meta-, para-)	C	P	III	PV	Restr	A	.409, .440, .908(b), <sup>8</sup>	
Xylenes, Ethylbenzene (10% or more mixture)	B	P	III	PV	Restr	A	.409, .....	
Xylenol	B	S/P	III	NR	Open	A, B	.409, .440, .908(a), (b)	
Zinc alkaryl dithiophosphate (C7-C16)	C	P	III	NR	Open	A, B	.409, .903, .908(a)) <sup>1</sup>	
Zinc alkyl dithiophosphate (C3-C14)	B	P	III	NR	Open	A, B	.409, (.440, .908(a)) <sup>1</sup>	

## Column I-Heading Footnotes:

a. The cargo name must be as it appears in this column (see 153.900, 153.907). Words in italics are not part of the cargo name but may be used in addition to the cargo name. When one entry references another entry by use of the word "see", and both names are in roman type, either name may be used as the cargo name (e.g., Diethyl ether, see Ethyl ether). However, the referenced entry is preferred.

The provisions contained in 46 CFR part 197, subpart C, apply to liquid cargoes containing 0.5% or more benzene by volume.

b. This column lists the IMO Annex I Pollution Category.

A, B, C, D—NLS Category of Annex I of MARPOL 73/78.

III—Appendix III (non-NLS cargoes) of MARPOL 73/78.

#—No determination of NLS status. For shipping on an ocean-going vessel, see 46 CFR 153.900(c).

[]—NLS category in brackets indicates that the product is provisionally categorized and that further data are necessary to complete the evaluation of its pollution hazards. Until the hazard evaluation is completed, the pollution category assigned is used.

@—The NLS category has been assigned by the U.S. Coast Guard, in absence of one assigned by the IMO. The category is based upon a GESEAMP Hazard Profile or by analogy to a closely related commodity.

c. This column lists the hazard(s) of the commodity.

S—The commodity is included because of its safety hazards.

P—The commodity is included because of its pollution hazards.

S/P—The commodity is included because of both its safety and pollution hazards.

d. This column lists the type of containment system the cargo must have (see 153.230 through 153.232).

e. This column lists the height of any vent riser required (see 153.350 and 153.351).

f. This column lists any vent control valve required (see 153.355).

g. This column lists the type of gauging system required (see 153.400 through 153.406).

h. This column lists the type of fire protection system required. Where more than one system is listed, any listed system may be used. A dry chemical system may not be substituted for either type of foam system unless the dry chemical system is listed as an alternative or the substitution is approved by Commandant (G-MSO) (see 153.460). The types are as follows:

A is a foam system for water soluble cargoes (polar solvent foam).

B is a foam system for water insoluble cargoes (non-polar solvent foam).

C is a water spray system.

D is a dry chemical system.

NSR means there is no special requirement applying to fire protection systems.

i. This column lists sections that apply to the cargo in addition to the general requirements of this part. The 153 Part number is omitted.

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i. This column lists the electrical hazard class and group used for the cargo when determining requirements for electrical equipment under Subchapter J (Electrical Engineering) of this chapter.  
 A number of electrical hazard class and group assignments are based upon that which appears in "Classification of Gases, Liquids and Volatile Solids Relative to Explosion-Proof Electrical Equipment," Publication NWAB 355-5, National Academy Press, 1982, when not appearing in NPA 437M, "Manual for Classification of Gases, Vapors and Dusts for Electrical Equipment in Hazardous (Classified) Locations."  
 The -B electrical hazard does not apply to weather deck locations (see 46 CFR Part 111) for inorganic acids; Chlorosulfonic acid; Hydrochloric acid; Nitric acid (70% or less); Oleum; Phosphoric acid; Sulfuric acid.

Abbreviations used in the Table:

NR—No requirement.

NA—Not applicable.

Abbreviations for Noxious Liquid cargoes:  
 F.—non-flammable (flash point less than or equal to 60 deg C (140 deg F) closed cup (cc)).

n.o.s.—not otherwise specified.

ST—Ship type.

Cat—Pollution category.

Footnotes for Specific Cargoes:

1. Special applicability  
 153.440 and 908(a) apply to the chemical, and mixtures containing the chemical, with a viscosity of 25 mPa.s at 20 deg C (68 deg F).  
 153.440 and 908(b) apply to the chemical, and mixtures containing the chemical, with a melting point of 0 deg C (32 deg F) and above.

153.448 applies to the chemical, and mixtures containing the chemical, with a melting point of 15 deg C (59 deg F) and above.

2. Benzene containing cargoes.

Applies to mixtures containing no other components with safety hazards and where the pollution category is C or less.

3. Diammonium salt of Zinc ethyl nediaminefetraacetic acid solution; Tetraethylenepentamine.

Aluminum is a questionable material of construction with this cargo since pitting and corrosion has been reported. The IMO Chemical Code prohibits aluminum as a material of construction for this cargo.

4. 2,4-Dichlorophenol.

Some tank pitting has been reported when this cargo is contaminated with water, including moisture in the air. The IMO Chemical Code requires that the vapor space over this cargo be kept dry.

5. Reserved.

6. Diphenylmethane diisocyanate; Hexamethylene diisocyanate; Isophorone diisocyanate; Poly(ethylene polyphenyl isocyanate); Toluene diisocyanate; Trimethylhexamethylene diisocyanate (2,2,4- and 2,4,4-isomers).

Water is effective in extinguishing open air fires but will generate hazardous quantities of gas if put on the cargo in enclosed spaces.

7. Maleic anhydride; Nitroethane; 1-Nitropropane; 1- or 2-Nitropropane; Nitropropane; Nitroethane mixtures.

Dry chemical extinguishers should not be used on fires involving these cargoes since some dry chemicals may react with the cargo and cause an explosion.

8. Xylenes.

Special requirement 908(b) only applies to the para- (p-) isomer, and mixtures containing the para-isomer having a melting point of 0 deg C (32 deg F) or more.

[USCG 2000-7079, 65 FR 67196, Nov. 8, 2000]

## Coast Guard, DHS

## Pt. 153, Table 2

TABLE 2 TO PART 153—CARGOES NOT REGULATED UNDER SUBCHAPTERS D OR O OF THIS CHAPTER WHEN CARRIED IN BULK ON NON-OCEANGOING BARGES

The cargoes listed in this table are not regulated under subchapter D or O of this title when carried in bulk on non-oceangoing barges. Category A, B, or C noxious liquid substance (NLS) cargo, as defined in § 153.2 of this chapter, listed in this table, or any mixture containing one or more of these cargoes, must be carried under this subchapter if carried in bulk on an oceangoing ship. Requirements for Category D NLS cargoes and mixtures of non-NLS cargoes with Category D NLS cargoes are in 33 CFR part 151.

Cargoes	Pollution Category	Pollution Category
Glycine, sodium salt solution .....	III	
Hexamethylenediamine adipate solution .....	D	
N-(Hydroxyethyl)ethylenediamine triacetic acid, trisodium salt solution .....	D	
Kaolin clay solution .....	III	
Kaolin slurry .....	III	
Kraft pulping liquor (free alkali content, 1% or less) <i>including: Black, Green, or White liquor</i> .....	#	
Lignin liquor (free alkali content, 1% or less) <i>including:</i>	#	
Ammonium lignosulfonate solution ....	III	
Calcium lignosulfonate solution ....	III	
Sodium lignosulfonate solution ....	III	
Lignin sulfonic acid, sodium salt solution, <i>see also</i> Lignin liquor or Sodium lignosulfonate solution .....	III	
Magnesium chloride solution .....	III	
Magnesium hydroxide slurry .....	III	
Milk .....	III	
Molasses .....	III	
Molasses residue ( <i>from fermentation</i> ) .....	[III]	
Naphthenic acid, sodium salt solution .....	[A]	
Noxious liquid, N.F., (1) n.o.s. ("trade name" contains "principle components") ST 1, Cat A ( <i>if non-flammable or non-combustible</i> ) .....	A	
Noxious liquid, N.F., (3) n.o.s. ("trade name" contains "principle components") ST 2, Cat A ( <i>if non-flammable or non-combustible</i> ) .....	A	
Noxious liquid, N.F., (5) n.o.s. ("trade name" contains "principle components") ST 2, Cat B ( <i>if non-flammable or non-combustible</i> ) .....	B	
Noxious liquid, N.F., (6) n.o.s. ("trade name" contains "principle components") ST 2, Cat B, mp. equal to or greater than 15 deg. C ( <i>if non-flammable or non-combustible</i> ) .....	B	
Noxious liquid, N.F., (9) n.o.s. ("trade name" contains "principle components") ST 3, Cat A ( <i>if non-flammable or non-combustible</i> ) .....	A	
Noxious liquid, N.F., (11) n.o.s. ("trade name" contains "principle components") ST 3, Cat B ( <i>if non-flammable or non-combustible</i> ) .....	B	
Noxious liquid, N.F., (12) n.o.s. ("trade name" contains "principle components") ST 3, Cat B, mp. equal to or greater than 15 deg. C ( <i>if non-flammable or non-combustible</i> ) .....	B	
Noxious liquid, N.F., (15) n.o.s. ("trade name" contains "principle components") ST 3, Cat C ( <i>if non-flammable or non-combustible</i> ) .....	C	
Noxious liquid, n.o.s. (17) ("trade name," contains "principal components"), Category D ( <i>if non-flammable or non-combustible</i> ) .....	D	
Non-noxious liquid, n.o.s. (18) ("trade name," contains "principal components"), Appendix III ( <i>if non-flammable or non-combustible</i> ) .....	III	
Pentasodium salt of Diethylenetriamine pentaacetic acid, pentasodium salt solution..		
Diethylenetriamine pentaacetic acid, pentasodium salt solution .....		
1,4-Dihydro-9,10-dihydroxy anthracene, disodium salt solution .....		
Dodecenylsuccinic acid, dipotassium salt solution .....		
Drilling brine (containing Calcium, Potassium, or Sodium salts) ( <i>see also</i> Potassium chloride solution (10% or more)) .....		
Drilling brine (containing Zinc salts) .....		
Drilling mud (low toxicity) ( <i>if non-flammable and non-combustible</i> ) .....		
Ethylenediaminetetraacetic acid, tetrasodium salt solution .....		
Ethylene-Vinyl acetate copolymer ( <i>emulsion</i> ) .....		
Ferric hydroxyethylatedylenediamine triacetic acid, trisodium salt solution .....		
Fish solubles ( <i>water based fish meal extracts</i> ) .....		
Fructose solution .....		
Glucose solution .....		

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Cargoes	Pollution Category
Sodium lignosulfonate solution, <i>see also</i> Lignin liquor .....	III
Sodium naphthenate solution (free alkali content, 3% or less), <i>see</i> Naphthenic acid, sodium salt solution..	
Sodium poly(4+)acrylate solution .....	III
Sodium silicate solution .....	C
Sodium sulfate solution .....	III
Sorbitol solution .....	III
Sulfonated polyacrylate solution .....	III
Tetrasodium salt of Ethylenediaminetetraacetic acid solution, <i>see</i> Ethylenediaminetetraacetic acid, tetrasodium salt solution.	
Titanium dioxide slurry .....	III
1,1,1-Trichloroethane .....	C
1,1,2-Trichloro-1,2,2-trifluoroethane .....	C
Trisodium salt of N-(Hydroxyethyl)ethylenediamine triacetic acid solution, <i>see</i> N-(Hydroxyethyl)ethylenediamine triacetic acid, trisodium salt solution..	
Urea, Ammonium mono- and di-hydrogen phosphate, Potassium chloride solution .....	D
Urea, Ammonium nitrate solution (2% or less NH <sub>4</sub> ), <i>see also</i> Ammonium nitrate, Urea solution (2% or less) .....	
Urea, Ammonium phosphate solution, <i>see also</i> Ammonium phosphate, Urea solution .....	D
Urea solution .....	
Vanillan black liquor (free alkali content, 1% or less) .....	#
Vegetable protein solution ( <i>hydrolysed</i> ) .....	III
Water .....	III
Zinc bromide, Calcium bromide solution, <i>see</i> Drilling brine (containing Zinc salts).	

Explanation of Symbols: As used in this table, the following stand for:

A, B, C, D—NLS Category of Annex II of MARPOL 73/78.  
I—Considered an “oil” under Annex I of MARPOL 73/78.  
III—Appendix III of Annex II (non-NLS cargoes) of MARPOL 73/78.

LFG—Liquefied flammable gas.

#—No determination of NLS status. For shipping on an ocean-going vessel, see 46 CFR 153.900(c).

[ ]—A NLS category in brackets indicates that the product is provisionally categorized and that further data are necessary to complete the evaluation of its pollution hazards. Until the hazard evaluation is completed, the pollution category assigned is used.

@ The NLS category has been assigned by the U.S. Coast Guard, in absence of one assigned by the IMO. The category is based upon a GESAMP Hazard Profile or by analogy to a closely related product having an NLS assigned.

Abbreviations for Noxious liquid Cargoes:  
N.F.—non-flammable (flash point greater than 60 degrees C (140 degrees F) cc).  
n.o.s.—not otherwise specified.  
ST—Ship type.  
Cat—Pollution category.

[CGD 88-100, 54 FR 43584, Oct. 26, 1989; CGD 92-100, 59 FR 17044, Apr. 11, 1994, as amended by CGD 94-900, 59 FR 45142, Aug. 31, 1994; CGD 94-902, 60 FR 34043, June 29, 1995; CGD 95-900, 60 FR 34052, June 29, 1995; USCG 2000-7079, 65 FR 67213, Nov. 8, 2000]

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APPENDIX I TO PART 153 [RESERVED]

APPENDIX II TO PART 153—METRIC UNITS USED IN PART 153

Parameter	Metric (SI unit)	Abbreviation	Equivalent to English or common metric
Force .....	Newton .....	N .....	0.225 lbs.
Length .....	Meter .....	m .....	39.37 in.
	Centimeter .....	cm .....	.3937 in.
Pressure .....	Pascal .....	Pa .....	$1.45 \times 10^{-4}$ lbs/in <sup>2</sup> .
	Kilo-Pascal (1,000 Pascals).	kPa .....	0.145 lbs/in <sup>2</sup> .
	.....do .....	kPa .....	$1.02 \times 10^{-2}$ kg/cm <sup>2</sup> .
Temperature .....	Degree Celsius .....	°C .....	$1 \times 10^3$ N/m <sup>2</sup> .
Viscosity .....	milli-Pascal second.	mPa sec.	1.0 centipoise.
Volume .....	Cubic meter .....	m <sup>3</sup> .....	264 gallons (gal).
	.....do .....	m <sup>3</sup> .....	35.3 ft <sup>3</sup> .

[CGD 73-96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78-128, 47 FR 21212, May 17, 1982; CGD 81-101, 52 FR 7799, Mar. 12, 1987. Redesignated by CGD 92-100, 59 FR 17045, Apr. 11, 1994]

PART 154—SAFETY STANDARDS FOR SELF-PROPELLED VESSELS CARRYING BULK LIQUEFIED GASES

Subpart A—General

Sec.

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