

TABLE 151.05 TO SUBPART 151.05 OF PART 151—SUMMARY OF MINIMUM REQUIREMENTS

Cargo identification ¹		Temp.	Hull type	Cargo segregation tank	Tanks			Cargo transfer		Environmental control		Fire protection required	Special requirements in 46 CFR Part 151	Electrical hazard class and group	Temp. control install.	Tank internal inspect. period—years
Cargo name	Pressure				Type	Vent	Gauging device	Piping class	Control	Cargo tanks	Cargo handling space					
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	o.	p.	q.
Acetaldehyde	Press.	Amb.	II	1NA 2 i i	Ind. Pressure.	SR	Restr.	II	P-1	Inert	Vent F	Yes	.55-1(h) ...	I-C	NA	G
Acetic acid	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	.50-73 ......55-1(g) ...	I-D	NA	G
Acetic anhydride	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.50-73 ......55-1(g) ...	I-D	NA	G
Acetone cyanohydrin ..	Atmos.	Amb.	I	1 i 2 i	Integral Gravity.	PV	Closed	I	G-1	NR	Vent F	Yes	.50-5 ......50-70(b) .. .50-73 ......50-81	I-D	NA	G
Acetonitrile	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	No	I-D	NA	G
Acrylic acid	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.50-70(a) .. .50-73 ......50-81 ......58-1(a) ...	I-D	NA	G
Acrylonitrile	Atmos.	Amb.	II	1 i 2 i i	Integral Gravity.	PV	Closed	II	G-1	NR	Vent F	Yes	.55-1(e) ... .50-70(a) ..	I-D	NA	G
Adiponitrile	Atmos.	Amb.	II	1 i 2 i i	Integral Gravity.	PV	Open	II	G-1	NR	Vent F	Yes	No	I-D	NA	G
Alkylbenzenesulfonic acid (greater than 4%)	Atmos.	Elev.	III	1 i 2 i i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	.50-73 ......58-1(e) ...	I-B	NA	G
Alkyl(C7-C9) nitrates	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	.50-81 ......50-86	NA	NA	G
Allyl alcohol	Atmos.	Amb.	I	1 i 2 i i	Integral Gravity.	PV	Closed	I	G-1	NR	Vent F	Yes	.50-5 ......50-73	I-C	NA	G

Allyl chloride	Atmos.	Amb.	I	1 i i 2 i i	Integral Gravity.	PV	Closed	I	G-1	NR	Vent F	Yes	.50-5	I-D	NA	G
Aluminum sulfate solution.	Atmos.	Amb.	III	1 i i 2 i i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	.58-1(e) ...	NA	NA	G
Aminoethylethanolamine.	Atmos.	Amb.	III	1 i i 2 i i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	.55-1(b) ...	NA	NA	G
Ammonia, anhydrous	Press.	Amb.	II	1NA 2 i i	Ind. Pres- sure.	SR250 p.s.i.	Restr.	II	P-2	NR	Vent F	No	.50-30	I-D	NA	G
Ammonia, anhydrous	Atmos.	Low	II	1NA 2 i i	Ind. Gravity	PV	Restr.	II-L	G-2	NR	Vent F	No	.50-30	I-D	.40- 1(b)(1)	8
Ammonium bisulfite solution (70% or less).	Atmos.	Amb.	III	1 i i 2 i i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	No	.50-73	NA	NA	G
Ammonium hydroxide (28% or less NH ₃).	Atmos.	Amb.	III	1 i i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	No	.56-1(a), (b), (c), (f), (g).	I-D	NA	G
Aniline	Atmos.	Amb.	I	1 i i 2 i i	Integral Gravity.	PV	Closed	I	G-1	NR	Vent F	Yes	.50-5	I-D	NA	G
Anthracene oil (Coal tar fraction).	Atmos.	Amb. Elev.	II	1 i i 2 i i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	No	I-D	NA	G
Argon, liquefied	Press.	Low	III	1NA 2 i i	Ind. Pres- sure.	SR	Restr.	II-L	P-1	NR	Vent F	No	.40-1(a) ... .50-30	NA	.40-1(a)	G
Benzene	Atmos.	Amb.	III	1 i i 2 i i	Integral Gravity.	PV	Closed	II	G-1	NR	Vent F	Yes	.50-60	I-D	NA	G
Benzene hydrocarbon mixtures (containing Acetylenes) (having 10% Benzene or more).	Atmos.	Amb.	III	1 i i 2 i i	Integral Gravity.	PV	Closed	II	G-1	NR	Vent F	Yes	.50-60	I-D	NA	G
Benzene hydrocarbon mixtures (having 10% Benzene or more).	Atmos.	Amb.	III	1 i i 2 i i	Integral Gravity.	PV	Closed	II	G-1	NR	Vent F	Yes	.50-60	I-D	NA	G

Cargo identification ¹		Cargo segregation tank	Tanks			Cargo transfer		Environmental control		Special re-quiring tests in 46 CFR Part 151	Electrical hazard class and group	Temp. control install.	Tank in-ternal in-spect. period—years			
Cargo name	Pres-sure		Temp.	Hull type	Type	Vent	Gauging device	Piping class	Control					Cargo tanks	Cargo handling space	Fire protection re-quired
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	o.	p.	q.
Benzene, Toluene, Xylene mixtures (having 10% Benzene or more).	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Closed	II	G-1	NR	Vent F	Yes	.50-60	I-D	NA	G
Butadiene	Press.	Amb.	II	1NA 2 i i	Ind. Pres-sure.	SR	Restr.	II	P-2	NR	Vent F	Yes	.50-70(a) .. .50-73	I-B	NA	G
Butadiene, Butylene mixtures (containing Acetylenes).	Press.	Amb.	II	1NA 2 i i	Ind. Pres-sure.	SR	Restr.	II	P-1	NR	Vent F	Yes	.50-30	I-B	NA	G
													.50-70(a) .. .50-73			
													.56-1(b), (d), (f), (g).			
Butyl acrylate (all isomers).	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.50-70(a) .. .50-81(a), (b).	I-D	NA	G
Butylamine (all isomers).	Atmos.	Amb.	II	1 i i 2 i i	Ind. Gravity	PV	Closed	II	G-1	NR	Vent F	Yes	.55-1(c) ...	I-D	NA	G
Butyl methacrylate	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.50-70(a) .. .50-81(a), (b).	I-D	NA	G
Butyraldehyde (all isomers).	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Open	II	G-1	NR	Vent F	Yes	.55-1(h) ...	I-C	NA	G
Camphor oil (light)	Atmos.	Amb.	II	1 i i 2 i i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	No	I-D	NA	G
Carbolic oil	Atmos.	Amb.	I	1 i i 2 i i	Integral Gravity.	PV	Closed	I	G-1	NR	Vent F	Yes	.50-5	NA	NA	G
Carbon dioxide, liquefied.	Press.	Low	III	1NA 2 i	Ind. Pres-sure.	SR	Restr.	I-L	P-1	NR	Vent F	No	.50-30	NA	.40-1(b)(1)	G
Carbon disulfide	Atmos.	Amb.	II	1NA 2 i i	Ind. Gravity	PV	Restr.	II	G-1	Inert	Vent F	Yes	.50-40	I-A	NA	G
													.50-41			

	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	PV	Open	II	G-1	NR	Vent N	No	No	NA	NA	G
Carbon tetrachloride ...	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	PV	Restr.	II	G-2	NR	Vent N	Yes	.50-73	NA	NA	G
Cashew nut shell oil (untreated).	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	PV	Restr.	II	G-2	NR	Vent N	Yes	.50-73	NA	NA	G
Caustic potash solu- tion.	Atmos.	Amb. Elev.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	NR	No	.50-73 .55-1(i)	NA	NA	G
Caustic soda solution	Atmos.	Amb. Elev.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	NR	No	.50-73 .55-1(i)	NA	NA	G
Chlorine	Press.	Amb.	I	1NA 2 i i	Ind. Pres- sure.	SR300 p.s.i.	Indirect	I	P-2	NR	Vent F	No	.50-30 .50-31	NA	NA	3
Chlorobenzene	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Open	II	G-1	NR	Vent N	Yes	No	I-D	NA	G
Chloroform	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent F	No	No	NA	NA	G
Chlorohydrins (crude)	Atmos.	Amb.	I	1 i i 2 i i	Integral Gravity.	PV	Closed	I	G-1	NR	Vent F	Yes	.50-5	I-D	NA	G
o-Chloronitrobenzene	Atmos.	Amb.	I	1 i i 2 i i	Integral Gravity.	PV	Closed	I	G-1	NR	Vent F	Yes	.50-5 .50-73	NA	NA	G
Chlorosulfonic acid	Atmos.	Amb.	III	1 i i 2 i i	Integral Gravity.	PV	Open	II	G-1	NR	Vent N	No	.50-20 .50-21 .50-73	I-B	NA	G
Coal tar naphtha sol- vent.	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.50-73	I-D	NA	G
Coal tar pitch (molten)	Atmos.	Elev.	III	1 i i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.50-73	I-D	NA	G
Creosote	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	No	NA	NA	G
Cresols (all isomers) ..	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	No	NA	NA	G
Cresols with less than 5% Phenol, see Cresols (all isomers).																
Cresols with 5% or more Phenol, see Phenol.																

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Cargo name	Pres-sure			Temp.	Type	Vent	Gauging device	Piping class	Control	Cargo tanks						Cargo handling space
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	o.	p.	q.
Cresylate spent caustic.	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	No	.50-73 ......55-1(b)	NA	NA	G
Cresylic acid, sodium salt solution, see Cresylate spent caustic.																
Crotonaldehyde	Atmos.	Amb.	II	1 i 2 i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.55-1(h)	I-C	NA	G
Cyclohexanone	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.56-1(a), (b).	I-D	NA	G
Cyclohexanone, Cyclohexanol mixture.	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.56-1(b)	I-D	NA	G
Cyclohexylamine	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.56-1(a), (b), (c), (g).	I-D	NA	G
Cyclopentadiene, Styrene, Benzene mixture.	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent F	Yes	.50-60 ......56-1(b)	I-D	NA	G
iso-Decyl acrylate	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	.50-70(a) .. .50-81(a), (b), .55-1(c)	NA	NA	G
Dichlorobenzene (all isomers).	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.56-1(a), (b).	I-D	NA	G
Dichlorodifluoromethane.	Press.	Amb.	III	1NA 2 i	Ind. Pressure.	SR	Restr.	II	P-1	NR	NR	No	No	NA	NA	G
1,1-Dichloroethane	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	No	I-D	NA	G

	Atmos.	Amb.	II	1 i i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.55-1(f)	I-C	NA	G
2,2'-Dichloroethyl ether.	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	No	No	I-D	NA	G
Dichloromethane	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	No	.56-1(a), (b), (c), (g).	NA	NA	G
2,4-Dichlorophenoxyacetic acid, dimethylamine salt solution.	Atmos.	Amb. Elev.	III	1 i 2 i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	No	.56-1(a), (b), (c), (g).	NA	NA	G
2,4-Dichlorophenoxyacetic acid, tripropanolamine salt solution.	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	No	.56-1(a), (b), (c), (g).	NA	NA	G
1,1-Dichloropropane ...	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	No	I-D	NA	G
1,2-Dichloropropane ...	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	No	I-D	NA	G
1,3-Dichloropropane ...	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	No	I-D	NA	G
1,3-Dichloropropene ...	Atmos.	Amb.	II	1 i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	No	I-D	NA	G
Dichloropropene, Dichloropropane mixtures.	Atmos.	Amb.	II	1 i 2 i i	Integral Gravity.	PV	Closed	II	G-1	NR	Vent F	Yes	No	I-D	NA	G
2,2-Dichloropropionic acid.	Atmos.	Amb.	II	1 i 2 i	Integral Gravity.	PV	Restr.	II	G-1	Dry	Vent F	Yes	.50-73, .58-1(e) ...	NA	NA	G
Diethanolamine	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	.55-1(c) ...	NA	NA	G
Diethylamine	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.55-1(c) ...	I-C	NA	G
Diethylenetriamine	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	.55-1(c) ...	NA	NA	G

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Cargo name	Pres-sure			Temp.	Type	Vent	Gauging device	Piping class	Control	Cargo tanks						Cargo handling space
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	o.	p.	q.
Diethyl ether, <i>see</i> Ethyl ether.																
Diisobutylamine	Atmos.	Amb.	III	1 i i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.55-1(c) ...	I-C	NA	G
Diisopropanolamine	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	.55-1(c) ...	NA	NA	G
Diisopropylamine	Atmos.	Amb.	II	1 i i 2 i i	Integral Gravity.	PV	Closed	II	G-1	NR	Vent F	Yes	.55-1(c) ...	I-C	NA	G
N,N-Dimethylacetamide.	Atmos.	Amb.	III	1 i i 2 i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.56-1(b) ...	I-D	NA	G
Dimethylamine	Press.	Amb.	II	1NA 2 i i	Ind. Pres-sure.	SR	Restr.	II	P-2	NR	Vent F	Yes	.55-1(c) ...	I-C	NA	G
Dimethylethanolamine	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.56-1(b), (c).	I-C	NA	G
Dimethylformamide	Atmos.	Amb.	III	1 i i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.55-1(e) ...	I-D	NA	G
1,4-Dioxane	Atmos.	Amb.	II	1 i i 2 i i	Integral Gravity.	PV	Closed	II	G-1	Inert	Vent F	Yes	No	I-C	NA	G
Diphenylmethane diisocyanate.	Atmos.	Elev.	II	1 i i 2 i	Integral Gravity.	PV	Closed	I	G-1	Inert Dry	Vent F	Yes	.50-5 ......56-1(a), (b).	NA	Yes	G
Di-n-propylamine	Atmos.	Amb.	II	1 i i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.55-1(c) ...	I-C	NA	G
Dodecyl- dimethyl-amine, Tetradecyldimethylamine mixture.	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	.56-1(b) ...	NA	NA	G
Dodecyl phenol	Atmos.	Amb.	I	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	.50-73	I-D	NA	2

Epichlorohydrin	Atmos.	Amb.	I	1 i i 2 i i	Integral Gravity.	PV	Closed	I	G-1	NR	Vent F	Yes	.50-5	I-C	NA	G
Ethanolamine	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	.55-1(c) ...	I-D	NA	G
Ethyl acrylate	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.50-70(a) ... .50-81(a), (b).	I-D	NA	G
Ethylamine solution (72% or less).	Atmos.	Amb.	II	1 i i 2 i i	Integral Gravity.	PV	Closed	II	G-1	NR	Vent F	Yes	.55-1(b) ...	I-D	NA	G
N-Ethylbutylamine	Atmos.	Amb.	III	1 i i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.55-1(b) ...	I-C	NA	G
Ethyl chloride	Press.	Amb.	II	1NA 2 i i	Incl. Pres- sure.	SR	Restr.	II	P-2	NR	Vent F	Yes	No	I-D	NA	8
N-Ethylcyclohexylami- ne.	Atmos.	Amb.	III	1 i i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.55-1(b) ...	I-C	NA	G
Ethylene chlorohydrin	Atmos.	Amb.	I	1 i i 2 i i	Integral Gravity.	PV	Closed	I	G-1	NR	Vent F	Yes	.50-5	I-D	NA	G
Ethylene cyanohydrin	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	No	NA	NA	G
Ethylenediamine	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.55-1(c) ...	I-D	NA	G
Ethylene dibromide ...	Atmos.	Amb.	II	1 i i 2 i	Integral Gravity.	PV	Closed	II	G-1	NR	Vent F	No	No	NA	NA	G
Ethylene dichloride	Atmos.	Amb.	III	1 i i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	No	I-D	NA	G

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Type	Vent						Gauging device	Piping class	Control	Cargo tanks	Cargo handling space	k.	l.					
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	o.	p.	q.		
Ethylene glycol monoalkyl ethers. 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 iso-propyl ether	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	No	I-C	NA	G		
Ethylene glycol hexyl ether.	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	No	NA	NA	G		
Ethylene glycol propyl ether.	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	No	NA	NA	G		
Ethylene oxide	Press.	Amb.	I	1NA 2 i i	Ind. Pres-sure.	SR	Restr.	II	P-2	Inert	Vent F	Yes	.50-10 ......50-12	I-B	.40-1(c)	4		
Ethyl ether	Atmos.	Amb.	II	1NA 2 i i	Ind. Gravity	PV	Closed	II	G-1	Inert	Vent F	Yes	.50-40 ......50-42	I-C	NA	G		
2-Ethylhexyl acrylate ..	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	.50-70(a) .. .50-81(a), (b).	I-D	NA	G		
Ethylidene norbornene	Atmos.	Amb.	II	1 i i 2 i i	Integral Gravity.	PV	Closed	II	G-1	NR	Vent F	Yes	.50-5 ......50-74	NA	NA	G		
Ethyl methacrylate	Atmos.	Amb.	III	1 i i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.50-70(a) ..	I-D	NA	G		

	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	No	I-C	NA	G
2-Ethyl-3-propylacrolein.		Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	No	.50-20 ......50-75	I-B	NA	G
Ferric chloride solutions.	Atmos.	Amb.	III	1 i i 2 i i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	No	.50-20 ......50-75	I-B	NA	G
Fluorosilicic acid (30% or less).	Atmos.	Amb.	II	1 i i 2 i i	Ind. Gravity	PV	Closed	II	G-1	NR	Vent F	No	.50-20 ......50-22 ......50-73 ......50-77	I-B	NA	4
Formaldehyde solution (37% to 50%).	Atmos.	Amb.	III	1 i i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	No	.55-1(h) ...	I-B	NA	G
Formic acid	Atmos.	Amb.	III	1 i i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.50-73 ......55-1(i)	I-D	NA	G
Furfural	Atmos.	Amb.	III	1 i i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.55-1(h) ...	I-C	NA	G
Glutaraldehyde solution (50% or less).	Atmos.	Amb.	III	1 i i 2 i i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	No	No	NA	NA	G
Glyoxylic acid solution (50% or less).	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	.50-73 ......50-81 ......58-1(e) ...	NA	NA	G
Hexamethylenediamine solution.	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.55-1(c) ...	I-D	NA	G
Hexamethylenimine ..	Atmos.	Amb.	II	1 i i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.56-1(b), (c).	I-C	NA	G
Hydrochloric acid	Atmos.	Amb.	III	1NA 2 i i	Ind. Gravity	Open	Open	II	G-1	NR	Vent F	No	.50-20 ......50-22 ......50-73	I-B	NA	4
<i>Hydrofluorosilicic acid (25% or less), see Fluorosilicic acid (30% or less).</i>																
2-Hydroxyethyl acrylate.	Atmos.	Amb.	I	1 i i 2 i i	Integral Gravity.	PV	Closed	I	G-1	NR	Vent F	Yes	.50-5 ......50-70(a) .. .50-73 ......50-81(a), (b).	NA	NA	G

Cargo identification ¹		Cargo name	Pres-sure	Temp.	Hull type	Cargo segre-gation tank	Tanks			Cargo transfer		Environmental control		Fire protection required	Special re-quirements in 46 CFR Part 151	Electrical hazard class and group	Temp. control install.	Tank in-ternal in-spect. period— years
Type	Vent						Gauging device	Piping class	Control	Cargo tanks	Cargo handling space	Cargo tanks	Cargo tanks					
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	o.	p.	q.		
Isoprene	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Open	II	G-1	NR	Vent F	Yes	.50-70(a) .. .50-81(a), (b).	I-D	NA	G		
Kraft pulping liquors (free alkali content 3% or more) (including: Black, Green, or White liq-uor).	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	NR	No	.50-73 ......56-1(a), (c), (g).	NA	NA	G		
Mesityl oxide	Atmos.	Amb.	III	1 i i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	No	I-D	NA	G		
Methylacetylene, Pro-padiene mixture.	Press.	Amb.	III	1 NA 2 i i	Ind. Pres-sure.	SR	Restr.	II	P-2	NR	Vent F	Yes	.50-79	I-C	NA	G		
Methyl acrylate	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.50-70(a) .. .50-81(a), (b).	I-D	NA	G		
Methylamine solution (42% or less).	Atmos.	Amb.	II	1NA 2 i i	Ind. Gravity	PV	Closed	II	G-1	NR	Vent F	Yes	.56-1(a), (b), (c), (g).	I-D	NA	G		
Methyl bromide	Press.	Amb.	I	1NA 2 i i	Ind. Pres-sure.	SR	Closed	I	P-2	NR	Vent F	Yes	.50-5	I-D	NA	2		
Methyl chloride	Press.	Amb.	II	1NA 2 i i	Ind. Pres-sure.	SR	Restr.	II	P-2	NR	Vent F	Yes	.55-1(c) ...	I-D	NA	8		
Methylcyclopentadiene dimer.	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	No	I-B	NA	G		
Methyl diethanolamine	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	.56-1(b), (c).	I-C	NA	G		
2-Methyl-5-ethylpyridine.	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	.55-1(e) ...	I-D	NA	G		

Methyl methacrylate ...	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes .50-70(a) ... .50-81(a), (b).	I-D	NA	G
2-Methylpyridine	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes .55-1(c) ...	I-D	NA	G
alpha-Methylstyrene ...	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes .50-70(a) ... .50-81(a), (b).	I-D	NA	G
Monochloro- difluoromethane.	Press.	Amb.	III	1NA 2 i	Ind. Pres- sure.	SR	Restr.	I	P-1	NR	NR	No	NA	NA	G
Morpholine	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes .55-1(c) ...	I-C	NA	G
Motor fuel anti-knock compounds (con- taining lead alkyls).	Atmos.	Amb.	I	1 i i 2 i i i	Ind. Gravity	PV	Closed	I	G-1	NR	Vent F	Yes .50-6 ......50-73	I-D	NA	.50-6
Nitric acid (70% or less).	Atmos.	Amb.	II	1 i i 2 i i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	No .50-20 ......50-73 ......50-80	I-B	NA	4
Nitrobenzene	Atmos.	Amb.	I	1 i i 2 i i i	Integral Gravity.	PV	Closed	I	G-1	NR	Vent F	Yes .50-5 ......50-73	I-D	NA	G
Nitrogen, <i>liquefied</i>	Press.	Low	III	1NA 2 i	Ind. Pres- sure.	SR	Restr.	II-L	P-1	NR	Vent F	No .40-1(a) ... .50-30 ......50-36	NA	.40-1(a)	G
1- or 2-Nitropropane ...	Atmos.	Amb.	III	1 i i 2 i i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes .50-81	I-C	NA	G
o-Nitrotoluene	Atmos.	Amb.	I	1 i i 2 i i i	Integral Gravity.	PV	Closed	I	G-1	NR	Vent F	Yes .50-5 ......50-73	I-D	NA	G
Octyl nitrates (<i>all iso-</i> <i>mers</i>), see Alkyl(C7-C9) ni- trates.															
Oleum	Atmos.	Amb.	III	1 i i 2 i i i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	No .50-20 ......50-21 ......50-73	I-B	NA	4
Pentachloroethane	Atmos.	Amb.	III	1 i i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	No	NA	NA	G

Cargo identification ¹		Hull type	Cargo segregation tank	Tanks			Cargo transfer		Environmental control		Fire protection required	Special requirements in 46 CFR Part 151	Electrical hazard class and group	Temp. control install.	Tank internal inspect. period—years	
Cargo name	Pres-sure			Temp.	Type	Vent	Gauging device	Piping class	Control	Cargo tanks						Cargo handling space
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	o.	p.	q.
1,3-Pentadiene	Atmos.	Amb.	III	1 i 2 i i Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.50-70(a) .. .50-81	I-D	NA	G	
Perchloroethylene	Atmos.	Amb.	III	1 i 2 i i Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	No	No	NA	NA	G	
Phenol	Atmos.	Amb.	I	1 i i 2 i i Integral Gravity.	PV	Closed	I	G-1	NR	Vent F	Yes	.50-5	I-D	NA	2	
Phosphoric acid	Atmos.	Amb.	III	1 i i 2 i i Integral Gravity.	Open	Open	II	G-1	NR	Vent N	No	.50-20	I-B	NA	4	
												.50-23				
												.50-73				
Phosphorus, white (elemental).	Atmos.	Elev.	I	1 i i 2 i i Integral Gravity.	PV	Closed	I	G-1	Water Pad	Vent F	Yes	.50-50	NA	NA	4-8	
Phthalic anhydride (molten).	Atmos.	Elev.	III	1 i i 2 i i Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	No	I-D	NA	G	
Polyethylene polyamines.	Atmos.	Amb.	III	1 i i 2 i i Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	.55-1(e) ...	NA	NA	G	
Polyethylene polyphenyl isocyanate.	Atmos.	Amb.	II	1 i i 2 i i Integral Gravity.	PV	Closed	II	G-1	Dry	Vent F	Yes	.55-1(e) ...	NA	NA	G	
Potassium hydroxide solution, see Cautious potash solution.																
iso-Propanolamine	Atmos.	Amb.	III	1 i 2 i i Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	.55-1(c) ...	I-D	NA	G	
Propanolamine (isomer).	Atmos.	Amb.	III	1 i 2 i i Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	.56-1(b), (c)	I-D	NA	G	
Propionic acid	Atmos.	Amb.	III	1 i 2 i i Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	.50-73	I-D	NA	G	
												.55-1(g) ...				
iso-Propylamine	Atmos.	Amb.	II	1 i i 2 i i Integral Gravity.	PV	Closed	II	G-1	NR	Vent F	Yes	.55-1(c) ...	I-D	NA	G	

Propylene oxide	Press.	Amb.	II	1NA 2 i i	Ind. Pres- sure.	SR	Restr.	II	P-1	Inert	Vent F	Yes	.50-10 ......50-13	I-B	NA	G
iso-Propyl ether	Atmos.	Amb.	III	1 i i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	Inert	Vent F	Yes	.50-70(a) ..	I-D	NA	G
Pyridine	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.55-1(e)	I-D	NA	G
Sodium aluminate so- lution (45% or less).	Atmos.	Amb. Elev.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	NR	No	.50-73 ......56-1(a), (b), (c).	NA	NA	G
Sodium chlorate solu- tion (50% or less).	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	No	.50-73	NA	NA	G
Sodium dichromate solution (70% or less).	Atmos.	Amb.	II	1 i i 2 i i	Integral Gravity.	Open	Closed	II	G-1	NR	Vent N	No	.50-5(d) .... .50-73 ......56-1(b), (c).	NA	NA	G
Sodium hydroxide so- lution, see Caustic soda solution.																
Sodium hypochlorite solution (20% or less).	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	No	.50-73 ......56-1(a), (b).	NA	NA	G
Sodium sulfide, hydro- sulfide solutions (H ₂ S 15ppm or less).	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	No	.50-73 ......55-1(b)	NA	NA	G
Sodium sulfide, hydro- sulfide solutions (H ₂ S greater than 15ppm but less than 200ppm).	Atmos.	Amb.	III	1 i i 2 i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	No	.50-73 ......55-1(b)	NA	NA	G
Sodium sulfide, hydro- sulfide solutions (H ₂ S greater than 200ppm).	Atmos.	Amb.	II	1 i 2 i	Integral Gravity.	PV	Closed	II	G-1	NR	Vent F	No	.50-73 ......55-1(b)	NA	NA	G
Sodium thiocyanate solution (56% or less).	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	.58-1(a)	NA	NA	G

Cargo identification ¹		Hull type	Cargo segregation tank	Tanks			Cargo transfer		Environmental control		Fire protection required	Special requirements in 46 CFR Part 151	Electrical hazard class and group	Temp. control install.	Tank internal inspect. period—years	
Cargo name	Pressure			Temp.	Type	Vent	Gauging device	Piping class	Control	Cargo tanks						Cargo handling space
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	o.	p.	q.
Styrene monomer	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	.50-70(a) .. .50-81(a), (b).	I-D	NA	G
Sulfur (molten)	Atmos.	Elev.	III	1 i 2 i i	Integral Gravity.	Open	Open	II	G-1	Vent N	Vent N	Yes	.50-55	I-C	.40- 1(f)(1)	G
Sulfur dioxide	Press.	Amb.	I	1NA 2 i i	Ind. Pres- sure.	SR	Closed	.....	P-2	NR	Vent F	No	.50-30	NA	NA	2
Sulfuric acid	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	No	.50-20	I-B	NA	4
Sulfuric acid, spent	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	No	.50-20	I-B	NA	4
1,1,2,2-Tetrachloroethane.	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	No	.50-20	NA	NA	G
Tetraethylenepentamine.	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes	.55-1(c)	I-C	NA	G
Tetrahydrofuran	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.50-70(b) ..	I-C	NA	G
Toluenediamine	Atmos.	Elev.	II	1 i 2 i	Integral Gravity.	PV	Closed	II	G-1	NR	Vent F	Yes	.50-73	NA	NA	G
Toluene diisocyanate	Atmos.	Amb.	I	1 i 2 i i	Integral Gravity.	PV	Closed	I	G-1	Dry N ₂	Vent F	Yes	.50-5	I-D	NA	G
o-Tolidine	Atmos.	Amb.	II	1 i 2 i i	Integral Gravity.	PV	Closed	II	G-1	NR	Vent F	Yes	.55-1(e)	I-D	NA	G
1,2,4-Trichlorobenzene	Atmos.	Amb.	III	1 i 2 i i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.50-5	I-D	NA	G

	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	No .50-73 ......56-1(a)	I-D	NA	G
1,1,1,2-Trichloroethane	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	No .50-73 ......56-1(a)	I-D	NA	G
Trichloroethylene	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	No .50-73 ......56-1(a)	I-D	NA	G
1,2,3-Trichloropropane	Atmos.	Amb.	II	1 i 2 i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes .50-73 ......56-1(a)	I-D	NA	G
Triethanolamine	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes .55-1(b) ...	I-C	NA	G
Triethylamine	Atmos.	Amb.	II	1 i 2 i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes .55-1(e) ...	I-C	NA	G
Triethylenetetramine ...	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	Vent N	Yes .55-1(b) ...	I-C	NA	G
Triphenylborane (10% or less), Caustic soda solution.	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	NR	No .56-1(a), (b), (c).	NA	NA	G
Trisodium phosphate solution.	Atmos.	Amb. Elev.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	NR	No .50-73 ......56-1(a), (c).	NA	NA	G
Urea, Ammonium ni- trate solution (con- taining more than 2% NH ₃).	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	No .56-1(b) ...	I-D	NA	G
Valeraldehyde (all iso- mers).	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	PV	Restr.	II	G-1	Inert	Vent F	Yes No	I-C	NA	G
Vanillin black liquor (free alkali content 3% or more).	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	Open	Open	II	G-1	NR	NR	No .50-73 ......56-1(a), (c), (g).	NA	NA	G
Vinyl acetate	Atmos.	Amb.	III	1 i 2 i	Integral Gravity.	PV	Open	II	G-1	NR	Vent F	Yes .50-70(a) ... .50-81(a), (b).	I-D	NA	G
Vinyl chloride	Press.	Amb.	II	1NA 2 i i	Ind. Pres- sure.	SR	Closed	II	P-2	NR	Vent F	Yes .50-30 ......50-34	I-D	NA	8
Vinyl chloride	Atmos.	Low	II	1NA 2 i i	Ind. Gravity	PV	Closed	II-L	G-2	NR	Vent F	Yes .50-30 ......50-34	I-D	40- 1(b)(1)	8

Cargo identification ¹		Hull type	Cargo segregation tank	Tanks			Cargo transfer		Environmental control		Fire protection required	Special requirements in 46 CFR Part 151	Electrical hazard class and group	Temp. control install.	Tank internal inspect. period—years	
Cargo name	Pressure			Type	Vent	Gauging device	Piping class	Control	Cargo tanks	Cargo handling space						
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	o.	p.	q.
Vinylidene chloride	Atmos.	Amb.	II	1NA 2 I I	Ind. Gravity	PV	Closed	II	P-2	Padded	Vent F	Yes	.55-1(f) ..... .50-70(a) .. .50-81(a), (b).	I-D	NA	G
Vinyltoluene	Atmos.	Amb.	III	1 I 2 I I	Integral Gravity.	PV	Restr.	II	G-1	NR	Vent F	Yes	.50-70(a) .. .50-81 ......56-1(a), (b), (c), (g).	I-D	NA	G
For requirements see these sections in Part 151:	.....	.....	.10-1	.13- 5	.15- 1 .....	.15-5	.15- 10	.20- 1	.20- 5	.25-1	.25-2	.30	.....	111.105 (Subchapter J)	.40	.04- 5

See Table 2 of Part 153 for additional cargoes permitted to be carried by tankbarge.

Terms and symbols:

Segregation—Tank—

Line 1—Segregation of cargo from surrounding waters:

i = Skin of vessel (single skin) only required. Cargo tank wall can be vessel's hull.

ii = Double skin required. Cargo tank wall cannot be vessel's hull.

Line 2—Segregation of cargo space from machinery spaces and other spaces which have or could have a source of ignition:

i = Single bulkhead only required. Tank wall can be sole separating medium.

ii = Double bulkhead required. Cofferdam, empty tank, pumproom, tank with Grade E Liquid (if compatible with cargo) is satisfactory.

Internal tank inspection—

G—Indicates cargo is subject to general provisions of 151.04-5(b).

Specific numbers in this column are changes from the general provisions.

Abbreviations used:

Tank type: Ind = Independent.

Vent:

PV = Pressure vacuum valve.

SR = Safety relief.

Gauging device: Restr. = Restricted.

General usage:

NR = No requirement.

NA = Not applicable.

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