

United States of America Department of Homeland Security United States Coast Guard

Certification Date: 03 Apr 2020 Expiration Date: 03 Apr 2025

Certificate of Inspection

For shore on international valueous lites caractes suffice the requirements of SOLAS 74 as amended, regulation V/14, for a SAFE MAINTING DOCUMENT.

		2 22 II 22	2			<u></u>	
Vessel Name	Off	icul Number .	TO MON	mber	Call Sign	Service	
KIRBY 10087	12	224575				Tank B	large
							
Having Port	3.2	Hud Material	Hor	sepower	Propulsion		
WILMINGTON, DE		Steel	9				
UNITED STATES							
Place Built		Delivery Date	Keel Lad Date	Gross Tons	Net Toris	DWT	Length
ASHLAND CITY, TN		23Mar2010	21Feb2010	R-705	R-705		R-200.0
UNITED STATES		23141812010	211 002010	F	B-		10
UNITED STATES							
Owner			Opera				
KIRBY INLAND MARINE	_			BY INLAND 50 MARKET	MARINE, LP		
HOUSTON, TX 77007	ur			NNELVIEW			
UNITED STATES			UNI	TED STATE	S		
This vessel must be mann 0 Certified Lifeboatmen, 0	ed with the follow Certified Tanke	wing licensed men, 0 HSC	and unlicense Type Rating,	d Personnel and 0 GMD:	. Included in wh SS Operators.	nich there mu	st be
0 Masiers	0 Licensed Mater	0 Chief	Engineers	00	iters		
0 Chief Metes	0 First Class Pilo	ts 0 First A	Assistant Engine	ers.			
0 Second Mates	0 Radio Officers		id Assistant Engi				
0 Third Meles	0 Abie Seamen		Assistant Engine	ers			
Master First Class Pilot Mate First Class Pilots	0 Ordinary Seam 0 Deckhands		sed Engineers ied Member Engi				
In addition, this vessel may					ns in addition to	crew and no	Others Total
Persons allowed: 0	y carry or assert	igers, o Caler			no an acceptant to	CIGHT, AIRC IN	Others, rotal
Route Permitted And Co	onditions Of Op	peration:					
Lakes, Bays, and	Sounds						
Also, in fair weather of Florida.	nly, not more	than twelve	(12) miles	from shore	between St. Ha	irks and Cari	rabelle,
This vessel has been gr has been operated in sa salt water intervals an	it water more	than 6 month	is in any 12	month peris	od, the vessel	must be exa	
					• **		
***SEE NEXT PAGE FO							
With this Inspection for Cell Inspection, Houston-Galve the rules and regulations pr	ston certified the	vessel, in all	ted at Freepo respects, is in	rt, TX, UNITI	ED STATES, the	e Officer in C its vessel insp	harge, Marine rection laws and
	eriodic/Re-Inspe		Т	his certificate	issued by	1	/ ~
Date Zone	A/P/R	Signatur			ARRERO CDR,	USCG BYT	PECTION
2-7-21 Houston		Randa Wel.		loar in Charge, Mar			WECTON
2-2-22 New Osles	725	Sent KrA			Houston-6	Galveston	
1-31-23 HOU/GAL		WAY B. M	TO IN	pecton Zone			



United States of America Department of Homeland Security United States Coast Guard

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Vessel Name: KIRBY 10087

This tank barge is participating in the Eighth & Ninth Coast Guard Districts' Tank Barge Streamlined Inspection Program (TBSIP). Inspection activities aboard this barge shall be conducted in accordance with its Tank Barge Action Plan (TAP). Inspection issues concerning this barge should be directed to OCMI Houston-Galveston.

---Hull Exams---

 Exam Type
 Next Exam
 Last Exam
 Prior Exam

 DryDock
 31Mar2025
 20May2015
 23Mar2010

 Internal Structure
 31Mar2025
 03Apr2020
 20May2015

--- Liquid/Gas/Solid Cargo Authority/Conditions ---

Authorization: GRADE "A" AND LOWER AND SPECIFIED HAZARDOUS CARGOES

Total Capacity Units Highest Grade Type Part151 Regulated Part153 Regulated Part154 Regulated

10700 Barrels A Yes No No

Hazardous Bulk Solids Authority

Not Authorized

Loading Constraints - Structural

Tank Number	Max Cargo Weight per Tank (short tons)	Maximum Density (lbs/gal)
1	579	13.6
2	534	13.6
3	530	13.6

Loading Constraints - Stability

Hull Type	Maximum Load (short tons)	Maximum Draft (ft/in)	Max Density (lbs/gal)	Route Description
II	1244	8ft 0in	13.6	R, LBS
111	1565	9ft 6in	8.74	R, LBS

Conditions Of Carriage

Only those cargoes named in the vessel's Cargo Authority Attachment (CAA), Serial #C1-1000416, dated February 19, 2010, may be carried, and then only in the tanks indicated. When the vessel is carrying cargoes containing greater than 0.5% benzene, the person in charge is responsible for ensuring the provisions of 46 CFR 197, Subpart C are applied.

Per 46 CFR 150.130, the person in charge of the vessel is responsible for ensuring that the compatibility requirements of 46 CFR 150 are met. Cargoes must be checked for compatibility using figures, tables, and appendices of 46 CFR 150 in conjunction with the compatibility group numbers from the "Compat Group No" column listed in the vessel's CAA.

The maximum design density of cargo which may be filled to the tank top is 8.74 lbs/gal. Cargoes with higher densities, up to 13.6 lbs/gal, may be carried as slack loads, but shall not exceed the tank weight limits as listed above.

Per 46 CFR 151.10-15(c)(2) the max tank weight reflect uniform (within 5%) loading at the deepest draft allowed. When carrying Subchapter O cargoes at shallower drafts, the barge(s) should always be loaded uniformly.



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Certificate of Inspection

Vessei Name: KIRBY 10087

Vapor Control Authorization

In accordance with 46 CFR Part 39, excluding part 39.4000, this vessel's vapor collection system (VCS) has been inspected to the plans approved by MSC Letter # C1-1000416 dated February 19, 2010 and has been found acceptable for the collection of bulk liquid cargo vapors annotated with "Yes" in the CAA's VCS column. The VCS has been approved with a pressure side of 6 psig P/V valve with Coast Guard Approval 162.017/167/2. The cargo tank top is suitable for a maximum allowable working pressure (MAWP) of 6.5 psig.

--- Inspection Status ---

Fuel Tanks

Internal Examinations

Tank ID

Previous

Last

Next

Forward Main Deck

23Mar2010

Cargo Tanks

	Internal Exam			External Exan	n	
Tank Id	Previous	Last	Next	Previous	Last	Next
1	23Mar2010	20May2015	23Mar2025	23Mar2010	20May2015	23Mar2020
2	23Mar2010	20May2015	23Mar2025	23Mar2010	20May2015	23Mar2020
3	23Mar2010	20May2015	23Mar2025	23Mar2010	20May2015	23Mar2020
			Hydro Test			
Tank Id	Safety Valves		Previous	Last	Next	
1	-		-	23Mar2010	-	
2	-		-	23Mar2010	-	
3	-		-	23Mar2010	-	

--- Conditional Portable Fire Extinguisher Requirements---

Required Only During Transfer of Cargo or Operation of Barge Machinery

--- Fire Fighting Equipment ---

Fire Extinguishers - Hand portable and semi-portable

Quantity

Class Type

2

40-B

END



Serial #: C1-1000416 Dated: 19-Feb-10



Certificate of Inspection

Cargo Authority Attachment

Vessel Name: KIRBY 10087 Official #: 1224575

Shipyard: Trinity Ashland City

Hull#: 4712

46	CFR 151 Tank G	roun (hara	ctarie	ire													
	nk Group Information	Cergo Identification			Cargo	Tanks			Cargo Transfor		Environmental Control		Fire	Special Requirements		T	Τ	
Trik	Tanks in Group	Density	Press.	Тетр.	Hull Typ	Seg Tank	4	Vent	Gauge	Pipe Class	Cont	Tanks	Handling Space	Protection Provided	General	Materials of Construction		Temp Cont
A 1	#1,#2,#3	13.6	Atmos.	Amb.	l)	18 .28	Integral Gravity	PV	Closed	α	G-1	NR	NA	Portable	.50-60, .50-70(a), .50-70(b), .50-73, .50-81(a), .50-	55-1(b), (c), (e), (f), (h), (j), 56-1(a), (b), (c), (d), (e), (f), (g),	NR	No

Notes: 1. Under Environmental Control, Tanks, NR means that the tank group is suitable only for those cargoes which require no environmental control in the cargo tanks.

List of Authorized Cargoes

Cargo Identificatio		Conditions of Carriage								
Name	Chem Code	Compat Group No	Sub Chapler	Grade	Hull Type	Tank Group	Vapor Re App'd (Y or N)	vcs	Special Requirements in 48 CFR 151 General and Mat'ls of	insp. Period
Authorized Subchapter O Cargoes										
Acetonitrile	• ATN	37	0	С	(II	Α	Yes	3	No	G
Acrylonitrile	ACN	15 ²	0	С	l1	Α	Yes	4	.50-70(a), .55-1(a)	G
Adiponitrile	ADN	37	0	E	11	A	Yes	1	No	G
Alkyl(C7-C9) nitrates	AKN	34 2	0	NA	III	Α	No	N/A	.50-81, .60-88	G
Aminoethylethanolamine	AEE	8	0	E	III	Α	Yes	1	.55-1(b)	<u> </u>
Ammonium bisulfite solution (70% or less)	ABX	43 2	0	NA	ŧII	Α	No	N/A	.50-73, .56-1(a), (b), (c)	G
Ammonlum hydroxide (28% or less NH3)	AMH	6	0	NA	ELF	Α	No	N/A	.56-1(s), (b), (c), (f), (g)	G
Anthracene oil (Coal tar fraction)	AHO	33	0	NA	11	Α	No	N/A	No	G
Benzene	BNZ	32	0	C	(ii	Α	Yes	1	,50-60	G
Benzene or hydrocarbon mixtures (having 10% Benzene or more)	ВНВ	32 ²	0	С	111	Α	Yes	1	.50-60	G
Benzene or hydrocarbon mixtures (containing Acetylene and 10% Benzene or more)	ВНА	32 2	0	С	131	A	Yes	1	.50-60, .56-1(b), (d), (f), (g)	3
Benzene, Toluene, Xylene mixtures (10% Benzene or more)	BTX	32	0	B/C	(II	Α	Yes	1	.50-60	G
Butyl acrylate (all isomers)	BAR	14	0	D	(II	Α	Yes	2	.50-70(a), .50-81(a), (b)	G
Bulyi methacrylate	ВМН	14	0	D	tii	A	Yes	2	.50-70(a), .50-81(a), (b)	G
Butyraldehyde (all Isomers)	BAE	19	0	C	III	Α	Yes	1	.55-1(h)	G
Camphor oil (light)	CPO	18	0	D	11	Α	No	N/A	No	G
Carbon tetrachloride	CBT	36	0	NA	III	Α	No	N/A	No	G
Caustic potash solution	CPS	5 ²	0	NA	111	Α	No	N/A	.50-73, .55-1(j)	G
Caustic soda solution	CSS	5 ²	0	NA	III	Α	No	N/A	.50-73, .55-1 ()	G
Chemical Oil (refined, containing phenolics)	COD	21	0	E	H	Α	No	N/A	.50-73	G
Chlorobenzene	CRB	36	0	D	III	Α	Yes	1	No	G
Chloroform	CRF	36	0	NA	ttl	Α	Yes	3	No	G
Coal tar naphtha solvent	NCT	33	0	D	111	Α	Yes	1	.50-73	G
Creosote	CCW	21 2	0	E	111	Α	Yes	1	No	G
Cresols (all Isomers)	CRS	21	0	E	111	Α	Yes	1	No	G
Cresylate spent caustic	CSC	5	0	NA	Ш	A	No	N/A	.50-73, ,65-1(b)	G
Cresylic acid tar	CRX		0	E	111	Α	Yes	1	.55-1(1)	G
Crotonaldehyde	CTA	19 2	0	C	11	Α	Yes	4	.55-1(h)	G
Crude hydrocarbon feedstock (containing Butyraldehydes and Ethylpropyl acrolein)	CHG		0	С	III	Α	No	N/A	No	G
Cyclohexanone	ССН	18	0	D	III	Α	Yes	1	.60-1(a). (b)	G
Cyclohexanone, Cyclohexanol mixture	CYX	18 2	0	E	m	Α	Yes	1	.56-1 (b)	G
Cyclohexylamine	· CHA	7	0	D	III	Α	Yes	1	.50-1(a), (b), (c), (g)	G

^{***} This document is only valid when attached to, and referenced by a current, valid Certificate of Inspection. ***

^{2.} Under Environmental Control, Handling Space, NR means that the tank group is suitable only for those cargoes which require no environmental control in the cargo handling space. NA means that the vessel does not have a cargo control space, and this requirement is not applied.

^{3.} Under Electrical Hazard Class, NA means that the tank group is suitable only for those cargoes which have no electrical hazard class requirement. NR means that the vessel has no electrical equipment located in a hazardous location.

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Certificate of Inspection

Cargo Authority Attachment

Vessel Name: KIRBY 10087 Official #: 1224575

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Shipyard: Trinity Ashland City

Cargo Identificatio	n							Condi	tions of Carriage	
Name	Chem	Compat Group No	Sub Chapter	Grade	Hull Type	Tank Group	Vapor R App'd (Y or N)	VCS Category	Special Requirements in 46 CFR 151 General and Mat'ts of	Insp. Period
Cyclopentadiene, Styrene, Benzene mixture	CSB	30	-	<u> </u>			Yes	1	.50-60, .58-1(b)	в
iso-Decyl acrylate	· IAI	14		E	111	A	Yes	2	.50-70(a), .50-81(a), (b), .55-1(c)	G
Dichlorobenzene (all isomers)	. DBX	36	0	Ē	111	A	Yes	3	.56-1(a), (b)	3
1.1-Dichloroethane	DCH	36	-	ċ	111	A	Yes	1	No	G
2,2'-Dichloroethyl ether	DEE	41	<u> </u>	Ď	11	A	Yes	1	.55-1(1)	G
Dichloromethane	DCM	36	0	NA	Œ	A	Yes	5	No	G
2,4-Dichlorophenoxyacetic acid, diethanolamine sait solution	DDE	43	0	E	III	A	No	N/A	.68-1(a), (b), (c), (g)	G
2,4-Dichlorophenoxyacetic acid, dimethylamine salt solution	. DAD	0 1,2		A	111	A	No	N/A	.56-1(a), (b), (c), (g)	G
2,4-Dichlorophenoxyacetic acid, triisopropanolamine salt solution	DTI	43 2	0	E	111	A	No	N/A	.56-1(a), (b), (c), (g)	G
1.1-Dichloropropane	DPB	36	-	c	- III	A	Yes	3	No	G
1,2-Dichloropropane	DPP	36	0	C	tii	Α	Yes	3	No	G
1,3-Dichloropropane	DPC	36	0	С	(II)	Α	Yes	3	No	G
1,3-Dichioropropene	, DPU	15	0	D	(I	A	Yes	4	No	G
Dichloropropene, Dichloropropane mixtures	DMX	15	ō	C	ii	A	Yes	1	No	G
Diethanclamine	· DEA	8	0	E	III	Α	Yes	1	.55-1(c)	G
Diethylamine	DEN	7	0	С	111	A	Yes	3	.55-1(c)	G
Diethylenetriamine	DET	72	<u> </u>	E	111	A	Yes	1	.55-1(c)	G
Disobutylamine	DBU	7	0	D	111	A	Yes	3	.55-1(c)	G
Dilsopropanolamine	. DIP	8	-	E	III	A	Yes	1	.55-1(c)	G
Dilsopropylamine	. DIA	7	0	C	11	A	Yes	3	.5S-1(c)	g
N,N-Dimethylacetamide	· DAC	10	0	Ē	III	A	Yes	3	.56-1(b)	G
Dimethylethanolamine	. DMB	8	-	0	- III	A	Yes	1	.56-1(b), (c)	G
Dimethylomamide	DMF	10	0	ō	111	A	Yes	1	.65-1(o)	G
Oi-n-propylamine	DNA	7	-	-	11	A	Yes	3	.55-1(c)	G
Dodecyldimethylamine, Tetradecyldimethylamine mixture	. DOT	7	<u> </u>	Ē	10	A	No	N/A	.6G-1(b)	G
Dodecyl diphenyl ether disulfonate solution	DOS	43	-	#		A	No	N/A	No	G
EE Glycol Ether Mixture	EEG	40	-	<u> </u>	111	A	No	N/A	No	G
Ethanolamine	MEA	8	-	E	111	A	Yes	1	.55-1(c)	G
	EAC	14	ō	c	111	A	Yes	2	.50-7G(a), .50-81(a), (b)	g
Ethyl acrylate Ethylamine solution (72% or less)	EAN	7	-	A	 II	A	No	N/A	····	G
N-Ethylbutylamine	EBA	7	-	<u>D</u>	111	A	Yes	3	.55-1(b)	G
N-Ethylcyclohexylamine	ECC	7	-		111	A	Yes	1	.SS-1(b)	G
Ethylene cyanohydrin	ETC	20	0	E	(1)	Ä	Yes	1	No	G
	EDA	72	0	<u> </u>	111	A	Yes		.65-1(c)	G
Ethylenediamine Cthylenediamine	EDC	36 2	-	- c	111	A	Yes	 -	No	G
Ethylene dichlaride	EGH	40	-	Ε		A	No	N/A	No	G
Ethylene glycol hexyl ether	EGC	40	0	D/E	10		Yes	1	No	G
Ethylene glycol monoalkyl ethers	EGP	40	-	E .	111	A	Yes	1	No	G
Ethylene glycol propyl ether	EAI		-	E	111		Yes	2	.50-70(a), .50-81(a), (b)	G
2-Ethylhexyl acrylate	ETM	14	-	D/E	111	A A	Yes	2	,50-70(a)	6
Ethyl methacrylate	EPA	19 2	-	E	181	^	Yes	1	No	6
2-Ethyl-3-propylacrolain	FMS	19 2	-	D/E	101	$\frac{\hat{A}}{A}$	Yes	1	.65-1(h)	G
Formaldehyde solution (37% to 50%)	FFA	19	-	D	111	A	Yes		.55-1(h)	<u> </u>
Furfural	GTA	19	٥	NA	111	A	No	N/A		G
Glutaraidehyde solution (50% or less)		7	-	E	111	A	Yes	1	.53-1(c)	<u> </u>
Hexamethylenediamine solution	HMC	/7	- 0	c	- 111	- A	Yes	1	.50-1(b), (c)	- 6
Hexamethyleneimine	HMI	′						1	.50-70(a), .50-81(a), (b)	G
Hydrocarbon 5-9	HFN	20	<u> </u>	<u> </u>	<u> </u>	<u>A</u> _	Yes			3
Isoprene	IPR	30		Α	111	Α	No	N/A		



Dated

Serial #: C1-1000416 Dated: 19-Feb-10

Certificate of Inspection

Cargo Authority Attachment

Vessel Name: KIRBY 10087 Official #: 1224575

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Shipyard: Trinity Ashland City

Cargo Identification)						(Condit	ions of Carriage	
							Vapor R			
Name	Chem Code	Compat Group No	Sub Chapter	Grade	Huti Typa	Tank Group	App'd (Y of N)	VCS Category	Special Requirements in 46 CFR 151 General and Matts of	Insp. Period
Isoprene, Pentadiene mixture	IPN		0	В	01	Α	No	N/A	.50-70(a), .55-1(c)	G
Kraft pulping liquors (free sikell content 3% or more)(including: Black, Green, or White liquor)	KPL	5	0	NA	111	A	No	N/A	.50-73, .56-1(a), (c), (g)	G
Mesityl oxide	MSO	18 ²	0	D	(11)	A	Yes	1	No	<u> </u>
Methyl acrylate	MAM	14	0	Ç	111	A	Yes	2	.50-70(a), .50-81(a), (b)	G
Methylcyclopentadiene dimer	MCK	30	0	С	III	Α_	Yes	1	No	G
Methyl diethanolamine	MDE	8	0	6	11	Α	Yes	11	.56-1(b), (a)	G
2-Methyl-5-ethylpyridine	MEP	9	0	E	III	Α	Yes	1	.55-1(a)	G
Methyl methacrylate	MMN	1 14	0	С	III	Α	Yes	2	.50-70(a), .50-81(a), (b)	G
2-Methylpyridine	MPR	9	0	D	111	A	Yes	3	.55-1(c)	3
alpha-Methylstyrene	MSR	30	0	D	Ш	Α_	Yes	2	.50-70(a), .60-81(a), (b)	G
Morpholine	MPL	72	0	D	tti	Α	Yes	1	.55-1(c)	G
1- or 2-Nitropropane	NPM	42	0	D	(II)	Α	Yes	1	.50-81	G
1,3-Pentadiene	PDE	30	٥	A	111	Α	No	N/A	.50-70(a), .50-81	G
Perchloroethylene	PER	36	0	NA	111	Α	No	N/A		G
Polyethylene polyamines	PEB	72	0	E	[[]	Α	Yes	1	.65-1(0)	g .
iso-Propanolamine	MPA	. 8	0	E	111	Α	Yes	1	.55-1(c)	G
Propanolamine (iso-, n-)	PAX	8	0	٤	H	Α	Yes	1	.56-1(b), (c)	G
iso-Propylamine	IPP	7	0	Α	II.	Α	Yes	5	.55-1(c)	G
Pyridine	PRD	9	0	C	[1]	Α	Yes	1	.55-1(e)	G
Sodium acetate, Glycol, Water mixture (3% or more Sodium Hydroxide)	SAP		0		111	A	No	N/A	.50-73, .56-1()	G
Sodium aluminate solution (45% or less)	ŞAŲ	5	0	NA	111	Α	No	N/A	.50-73, .58-1(a), (b), (c)	G
Sedium chlorate solution (50% or less)	SDD	0 1,2	0	NA	UI!	Α	No	N/A		G
Sodium hypochlorite solution (20% or less)	SHQ	5	0	NA	Ui	A	No	N/A		G
Sodium suifide, hydrosuifide solution (H2S 15 ppm or less)	SSH	0 1,2	0	NA	- OR	Α	Yes	1	.50-73, .55-1(6)	G
Sodium sulfide, hydrosulfide solution (H2S greater than 15 ppm but less than 200 ppm)	SSI	0 1.2	0	NA	111	Α	No	N/A		G ——
Sodium sulfide, hydrosulfide solution (H2S greater than 200 ppm)	SSJ	0 1,2	0	NA	11	A	No	N/A	.50-73, .55-1(b)	G
Styrene (crude)	STX		0	D	III	Α	Yes	2	No	G
Styrene monomer	STY	30	0	D	111	Α	Yes	2	.50-70(a), .50-81(a), (b)	G
1,1,2,2-Tetrachloroethane	TEC	36	0	NA	III	Α	No	N/A		3
Tetraethylenepentamine	TTP	7	0	E	III	Α	Yes	11	.56-1(a)	G
Telrahydrofuran	THF	41	0	С	III	Α	Yes	1	.50-70(b)	G
Toluenediamine	TDA	9	0	E	II	Α	No	N/A	.50-73, .56-1(a), (b), (c), (g)	G
1,2,4-Trichicrobenzene	TÇB	36	0	E	[1]	Α	Yes	1	No	G
1,1,2-Trichicroethane	TCM	36	0	NA	to I	A	Yes	1	.50-73, .56-1(a)	G
Trichlorcethylene	TCL	36 2	0	NA	111	Α	Yes	1	No	G
1,2,3-Trichlereprepane	TCN	36	0	E	II	Α	Yes	3	.60-73, .56-1(a)	G
Triethanolamine	TEA	8 ²	0	E	III	Α	Yes	1	.55-1(b)	G
Triethylamine	TEN	7	0	С	H	Α	Yes	3	.55-1(e)	G
Triethylenetetramine	TET	72	0	E	UIL	Α	Yes	1	.55-1(b)	G
Triphenylborane (10% or less), caustic soda solution	· TPB	5	0	NA	10	Α	No	N/A	.56-1(a), (b), (c)	G
Trisodium phosphate solution	TSP	5	0	NA	111	Α	No	N/A	.50-73, .55-1(e), (c).	Ġ
Urea, Ammonium nitrate solution (containing more than 2% NH3)	UAS		0	NA	Ш	Α	No	N/A	.58-1(b)	G
Vaniilin black tiquor (free alkali content, 3% or more).	VBL	5	0	NA	III	Α	No	N/A	.50-73, .50-1(a), (c), (g)	G
Vinyl acetate	VAM		0	С	111	Α	Yes	2	.50-70(a), .50-81(a), (b)	G
Vinyl neodecanate	VND		0	Ε	111	A	No	N/A	.50-70(a), .50-81(a), (b)	G
Vinyltoluene	VNT		0	D	III	Α	Yes	2	.60-70(a), .60-81, .58-1(a), (b), (c), (G
- A A A A A A A A A A A A A A A A A A A										

Serial #: C1-1000416 Dated: 19-Feb-10

Certificate of Inspection

Cargo Authority Attachment

Vessel Name: KIRBY 10087

Official #: 1224575

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Shipyard: Trinity Ashland City

Campat C	Cargo Identification	1			-				Condi	tions of Carriage	
Acetichemans	Name				Grade			App'd	vcs		
Acetichemans	Subchapter D Cargoes Authorized for Vapor Contro	ol									
Action C(C-2-C16) poly(1-6) enhoxylates			18 ²	D	C		Α	Yes	1		
Accher[CeC-17]genomicry poly?-12]ethoxylates	Acetophenone	ACP	18	D	E		Α	Yes	1		
Accepting Content of the content o	Alcohol(C12-C16) poly(1-6)ethoxylates	APU	20	۵	E		Α	Yes	1		
ANY alcohol (Sep. n., sep., primary) ANY 20 D D A Yes 1 Barray alcohol (Sep. n., sep., primary) Barray alcohol (Sep.) Barray alcoholol (Sep.) Barray alcoholol (Sep.) Barray alcoholol (Sep.) Barray alcohololololololol		AEB	20	D	Ε		Α	Yes	1		
Barcy alcohol Barcy Ba	Amyl acetate (all isomers)	AEC	34	D	D		Α	Yes	1		
Brake fluid base mixtures (containing Poly(2-8)altykane(C2-C2) glycals, Polyaltykane(C2-C3) glycals, Polyaltykane(C2-C10) glycal monosite (All somers)	Amyl alcohol (iso-, n-, sec-, primary)	AAI	20	D	D		Α		1		
September Polymer (CA-C10) Specific monosito Polymer Polymer	Benzyl alcohol	BAL	21	D	E		Α	Yes			
Suly alcohol (Iso-) IAL 20 ° D D D D D D D D D D D D D D D D D D	glycols, Polyalkylene(C2-C10) glycol monoalkyl(C1-C4) ethers, and										
Bulyl alcohol (In-) BAN 20 2 D D A Yes 1 Bulyl alcohol (In-) Bulyl alcohol (In-) BAS 20 2 D C A Yes 1 Bulyl alcohol (In-) Bulyl alcohol (In-) BAS 20 2 D C A Yes 1 Bulyl alcohol (In-) Bulyl alcohol (In-) BAS 20 2 D C A Yes 1 Bulyl benzyl phhelato BUH 32 D E A Yes 1 Bulyl benzyl phhelato Bulyl Bas 20 D D A Yes 1 Bulyl benzyl phhelato Bulyl Bas 20 D D A Yes 1 Cyclohexane CHX 31 D C A Yes 1 Cyclohexane CHX 32 D D A Yes 1 Cyclohexane CMP 32	Butyl acetate (all isomers)										
Butyl alcohol (sec-) BAS 20 2 D C A Yes 1 Butyl alcohol (set-) Butyl alcohol (set-) Butyl benzyl phthelate BPH 4 D E A Yes 1 Butyl benzyl phthelate BUE 32 D D A Yes 1 Caprolactam solutions CLS 22 D E A Yes 1 Caprolactam solutions CLS 22 D E A Yes 1 Caprolactam solutions CHN 21 D E A Yes 1 Cyclohexane CHN 21 D E A Yes 1 Cyclohexane CHN 20 D E A Yes 1 Cyclohexane Cyclohexane CHN 20 D E A Yes 1 Cyclohexane Cyclohexane CHN 20 D E A Yes 1 Cyclohexane Cyclohexane CHN 20 D E A Yes 1 Cyclohexane Cyclohexane Cyclohexane Cyclohexane Cyclohexane Cyclohexane CHN 20 D E A Yes 1 Cyclohexane Cyclohe	Butyl alcohol (iso-)		~				~~~				
Butyl atchord (tert-1)	Butyl alcohol (n-)								-		
Buyl benzy inhibitate BPH 34 D E A Yes 1 Buyl toluene BUE 32 D D A Yes 1 Caprolactam solutions CLIS 22 D E A Yes 1 Caprolactam solutions CHX 31 D C A Yes 1 Cyclohexane CHX 32 D D E A Yes 1 DA Yes 2 D-Owners CMP 32 D D A Yes 1 IN-Decaldelnyde IDA 19 D E A Yes 1 DECALDELNYDE DECA	Butyl alcohol (sec-)		20 ²								
BUE 32	Butyl alcohol (tert-)									······	
CLS 22 D E A Yes 1	Butyl benzyl phthalate								-		
Cyclohexane	Butyl toluene	BUE									
Cyclohuxanol	Caprolactam solutions	CLS	22							·	
1,3-Cyclopentacliene dimer (motilen)	Cyclohexane	CHX	31	D		·					
CMP 32	Cyclohexanol	CHN	20								
IDA	1,3-Cyclopentadiene dimer (mollen)	CPD	30								
Decomb DAL 19	p-Cymene	CMP	32								
December DCE 30 D D A Yes 1	iso-Decaldehyde		19								
Decyl alcohol (all isomers)	n-Decaldehyde	DAL	19								
December	Decene		30								
Diacetone alcohol DAA 20 2		DAX	20 2								
Ortho-Dibutyl pithalate DPA 34 D E A Yes 1 Diethylsenzene DEB 32 D D A Yes 1 Diethylsene glycol DEG 40 2 D E A Yes 1 Diisobutyl ketone DBL 30 D C A Yes 1 Diisobutyl ketone DIK 18 D D A Yes 1 Diisopropylbenzene (all Isamers) DIX 32 D E A Yes 1 Dimethyl phthalate DTL 34 D E A Yes 1 Dimethyl phthalate DCP 34 D E A Yes 1 Dipentilene DCP 34 D E A Yes 1 Diphenyl DilL 32 D D/E A Yes 1 Diphenyl, Diphenyl ether mixtures DDO 33	n-Decylbenzene, see Alkyl(C9+)benzenes										
Diethylbenzene DEB 32 D D A Yes 1	Diacetone alcohol										
Disputy Disp	ortho-Dibutyl phthalate										
Disobutylene Dil. 30 D C A Yes 1	Diethylbenzene	DEB	32	D							
Discourt Discourt Dik 18	Diethylane glycol	DEG	40 ²	_							
Disportopy/Disportation Dix 32 D E A Yes 1	Disobutylene	DBL	~								
Dimethyl phthalate DTL 34 D E A Yes 1	Disobutyl ketone										
Dictyl phthalate	Dilsopropylbenzene (all Isomers)										
Dipole	Dimethyl phthalate	DTL	34								
Diplanyl	Dioctyl phthalate	DOP	34								
Diphenyl ether mixtures DDO 33 D E A Yes 1	Dipentene				·						
Diphertyl ether	Diphanyi										
Diptrily ellies	Diphenyl, Diphenyl ether mixtures										
Distillates: Flashed feed stocks DFF 33 D E A Yes 1 Distillates: Straight run DSR 33 D E A Yes 1 Dodecene (all Isomers) DOZ 30 D D A Yes 1 Dodecylbenzene, see Alkyl(C9+)banzenes DDB 32 D E A Yes 1 2-Ethoxyethyl acetate EEA 34 D D A Yes 1	Diphenyl ether								~~~~		
Distillates: Straight run DSR 33 D E A Yes 1 Dodecene (all Isomers) DOZ 30 D D A Yes 1 Dodecylbenzene, see Alkyl(C9+)benzenes DDB 32 D E A Yes 1 2-Ethoxyethyl acetate EEA 34 D D A Yes 1	Dipropylene glycol						_				
Dodecene (all isomers) DOZ 30 D D A Yes 1 Dodecyibenzene, see Alkyl(C9+)benzenes DDB 32 D E A Yes 1 2-Ethoxyethyl acetate EEA 34 D D A Yes 1	Distillates: Flashed feed stocks										
Dodecylbenzene, see Alkyl(C9+)benzenes DDB 32 D E A Yes 1 2-Ethoxyethyl acetate EEA 34 D D A Yes 1	Distillates: Straight run										
2-Ethoxyethyl acetate EEA 34 D D A Yes 1							~~~~				
2-Ethoxyethyl acetate EEA 34 D D A Yes 1	Dodecyibenzene, see Alkyl(C9+)benzenes		32	~~~							
Ethoxy triglycol (crude) ETG 40 D E A Yes 1											
	Ethoxy triglycol (crude)	ETG	40	D	E		Α	Yes	1		

Department of Homeland Security

United States Coast Guard Certificate of Inspection Serial #: C1-1000416 19-Feb-10

Cargo Authority Attachment

Vessel Name: KIRBY 10087 Official #: 1224575

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Shipyard: Trinity Ashland City

Cargo Identificatio	n							Condi	tions of Carriage	
Name	Chem Code	Compat Group No	Sub Chapter	Grade	Hull Type	Tank Group	Vapor (App'd (Y or N)	Recovery VCS Category	Special Requirements in 46 CFR 151 General and Mat'ls of	Insp. Period
Ethyl acetate	ETA	34	D	╏	·'	A	Yes	1	<u> </u>	
Ethyl acetoacetate	EAA	34	D	E		Α	Yes	1		
Ethyl alcohol	EAL	20 ²	D	С		Α	Yes	1		
Ethylbenzene	ETB	32	D	C		Α	Yes	1		
Ethyl bulanol	EBT	20	D	D		A	Yes	1		
Ethyl tert-bulyl ether	EBE	41	D	С		Α	Yes	1		
Ethyl butyrate	EBR	34	D	D		Α	Yes	1		
Ethyl cyclohexane	ECY	31	D	D		Α	Yes	1		
Ethylene glycol	EGL	20 ²	D	E		A	Yes	1		
Ethylene glycol butyl ether acetate	EMA	34	D	E		A	Yes	1		
Ethylene glycol diacetate	EGY	34	D	Ε		Α	Yes	1		
Ethylene glycol phenyl ether	EPE	40	D	E		A	Yes	1		
Ethyl-3-ethoxypropionate	EEP	34	D	D		A	Yes	1		
2-Ethylhexanol	EHX	20	D	E		Α	Yes	1		
Ethyl propionate	EPR	34	D	С		Α	Yes	1		
Ethyl toluene	ETE	32	D	D		Α	Yes	1		
Formamide	FAM	10	D	E		A	Yes	1		
Furfuryl alcohol	FAL	20 ²	D	E		Ā	Yes	1		
Gasoline blanding stocks: Alkylates	GAK	33	D	A/C		A	Yes	1		
Gasoline blending stocks: Reformates	GRF	33	D	A/C		Α	Yes	1		
Gasolines: Automotive (containing not over 4.23 grams lead par gallon)	GAT	33	D	С		Α	Yes	1		
Gasolines: Aviation (containing not over 4.86 grams of lead per gallon)	GAV	33	0	С		Α	Yes	1		
Gasolines: Casinghead (natural)	GCS	33	٥	A/C		Α	Yes	1		
Gasofines: Polymer	GPL	33	D	A/C		Α	Yes	1		
Gasclines: Straight run	GSR	33	D	A/C		Α	Yes	1		
Glycerine	GCR	20 ²	D	E		Α	Yes	1		
Heptane (all isomers), see Alkanes (C6-C9) (all isomers)	HMX	31	D	С		Α	Yes	1		
Heptanoic acid	HEP	4	D	E		Α	Yes	1		
Heptanol (all isomers)	HTX	20	D	D/E		Α	Yes	1		
Heptene (all Isomers)	HPX	30	D	С		A	Yes	2		
Heptyl acelate	HPE	34	D	E		Α	Yes	1		
Hexane (all Isomers), see Alkanes (C6-C9)	HXS	31 2	D	B/C		Α	Yes	1		
Hexanoic acid	НХО	4	D	E		A	Yes	1		
Hexanol	HXN	20	D	D		A	Yes	1		
Hexene (all isomers)	HEX	30	D	С		Α	Yes	2		
Hexylene glycol	HXG	20	D	E		Α	Yes	1		
Isophorone	IPH	18 2	D	E		A	Yes	1		
Jet fuel: JP-4	JPF	33	D	Ε		Α_	Yes	1		
Jet fuel: JP-5 (kerosene, heavy)	JPV	33	D	D		Α	Yes	1		
Kerosane	KRS	33	D	0		A	Yes	1		
Methyl acetate	MTT	34		D		A	Yes	1		
Methyl alcohol	MAL	20 2	D	Ċ		A	Yes	1		
	MAC	34	<u> </u>	┰		A	Yes	1		
Methylamyl acetate Methylamyl alcohol	MAA	20	<u> </u>	D			Yes	;		
Methyl amyl ketone	MAK	18	D	D		A	Yes	1		
Methyl tert-butyl ether	MBE	41 2	<u>D</u>	ç		A	Yes	1		
	MBK		<u> </u>	ċ		— 7	Yes	1		
Methyl butyl ketone	MIDI	.0		<u> </u>			103			



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Shipyard: Trinity Ashland City

Cargo Identificati	ion					Conditions of Carriage						
	-							Recovery	Consist Consistent - 1- 10 CT			
Name	Chem Code	Compat Group No	Sub Chapter	Grade	Hull Type	Tank Group	App'd (Y or N)	VCS Calegory	Special Requirements in 46 CFR 151 General and Mat'is of	Insp. Period		
Methyl butyrate	MBU	34	D	С		Α	Yes	1				
Methyl ethyl ketone	MEK	18 ²	D	С		Α_	Yes	1				
Methyl heptyl ketone	MHK	18	D	D		Α	Yes	1				
Methyl Isobutyl ketona	MIK	18 2	D	С		Α	Yes	1				
Methyl naphthalene (molten)	MNA	32	D	E		Α	Yes	1				
Mineral spirits	MNS	33	D	D		Α	Yes	1				
Myrcene	MRE	30	D	D		A	Yes	1				
Naphtha: Heavy	NAG	33	D	#		A	Yes	11				
Naphtha: Petroleum	PTN	33	D	#		Α	Yes	1				
Naphtha: Solvent	NSV	33	D	D		Α	Yes	1				
Naphtha: Stoddard solvent	NSS	33	D	D		Α	Yes	1				
Naphtha: Varnish makers and painters (75%)	NVM	33	D	С		Α	Yes	1				
Nonane (all Isomers), see Alkanes (C6-C9)	NAX	31	D	D		Α	Yes	1				
Nonene (all isomers)	NON	30	D	D		Α	Yes	2				
Nonyl alcohol (all isomers)	NNS	20 ²	D	E		Α	Yes	11				
Nonyi phenol	NNP	21	D	E		Α	Yes	1				
Nonyl phenol poly(4+)athoxylates	NPE	40	D	E		Α	Yes	11				
Octane (ail Isomers), see Alkanes (C6-C9)	OAX	31	D	С		Α	Yes	1				
Octanoic acid (all isomers)	OAY	4	D	E		Α	Yes	1				
Octanol (all isomers)	OCX	20 ²	۵	E		Α	Yes	1				
Octene (all isomers)	OTX	30	D	С		Α	Yes	2				
Oil, fuel: No. 2	OTW	33	D	D/E		Α	Yes	1				
Oil, fuel: No. 2-D	ОТО	33	D	D		Α	Yes	1				
Oil, fuel: No. 4	OFR	33	D	D/E		Α	Yes	1		_		
Oil, fuel: No. 5	OFV	33	D	D/E		Α	Yes	1				
Oil, fuel: No. 6	OSX	33	D	E		Α	Yes	1				
Oil, misc: Crude	OIL	33	D	C/D		A	Yes	1				
Oil, misc: Diesel	ODS	33	D	D/E		Α	Yes	1				
Oil, misc: Gas, high pour	OGP	33	D	E		Α	Yes	1				
Oil, misc: Lubricating	OLB	33	D	E		Α	Yes	1				
Oil, misc: Residual	ORL	33	D	E		Α	Yes	1				
Oil, misc: Turbine	OTB	33	D	E		Α	Yes	1				
Pentane (all Isomers)	PTY	31	D	Α		Α	Yes	5				
Pentene (all isomers)	PTX	30	D	Α		Α	Yes	5				
alpha-Pinane	PIO	30	D	D		Α	Yes	1				
beta-Pinene	PIP	30	D	D		Α	Yes	1				
Poly(2-8)alkylene glycol monoalkyl(C1-C6) ether	PAG	40	D	E			Yes	1				
Poly(2-8)alkylens glycol monoalkyl(C1-C6) ether acetate	PAF	34	D	E		Α	Yes	1				
Polybutene	PLB	30	D	E		Α	Yes	1				
Polypropylene glycol	PGC	40	<u> </u>	E		A	Yes	1				
iso-Propyl acetate	IAC	34	<u> </u>	Ċ		A	Yes	1				
n-Propyl acetate	PAT	34	<u> </u>	ċ		Ā	Yes	1				
Iso-Propyl alcohol	IPA	20 2	- D	c		A	Yes	1				
n-Propyl alcohol	PAL	20 2	D	c		A	Yes	1				
	PBY	32	<u> </u>	-		A	Yes	-				
Propyibenzene (all Isomers)	IPX	31	<u> </u>	D		A	Yes	- 				
iso-Propylcyclohexane	PPG	20 ²	D	E		Â	Yes	1				
Propylene glycol	PGN	34	-	_		A	Yes	- 				
Propylene glycol methyl ether scetate	r GN	34					103					

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Vessel Name: KIRBY 10087 Official #: 1224575

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Shipyard: Trinity Ashland City

Cargo Identific	ation					Conditions of Carriage						
Name	Chem Code	Compat Group No	Sub Chapter	Grade	Hull Type	Tank Group	App'd	lecovery VCS Category	Special Requirements in 46 CFR 151 General and Mat'ls of	Insp. Period		
Propylens tetramer	PTT	30	D	D		A	Yes	1	· · · · · · · · · · · · · · · · · · ·			
Sulfolane	SFL	39	D	E		Α	Yes	1				
Tetraethylene glycol	TTG	40	D	E		Α	Yes	1				
Tetrahydronaphthalene	THN	32	D	E		Α	Yes	1				
Toluene	TOL	32	D	С		Α	Yes	1				
Tricresyl phosphate (less than 1% of the ortho isomer)	TCP	34	D	E		Α	Yes	1				
Triethylbenzene	TEB	32	D	E		A	Yes	1				
Triethylene glycol	TEG	40	D	E		Α	Yes	1				
Triethyl phosphate	TPS	34	D	E	-	Α	Yes	1				
Trimethylbenzene (all isomers)	TRE	32	D	(D)		Α	Yes	1	· · · · · · · · · · · · · · · · · · ·			
Trixylenyl phosphate	TRP	34	D	Ę		Α	Yes	1				
Undecene	UDC	30	D	D/E		Α	Yes	1				
1-Undecyl alcohol	UND	20	D	E		Α	Yes	1				
Xylenes (ortho-, meta-, para-)	XLX	32	D	D		Α	Yes	1				



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Certificate of Inspection Cargo Authority Attachment

Vessel Name: KIRBY 10087

Shipperd: Trinity Ashland

Hull #: 4712

Explanation of terms & symbols used in the Table:

Cargo Identification

The proper chipping name as ilsted in 46 CFR Table 30.25-1, 46 CFR Table 151.05, and 46 CFR Part 153 Table 2. The three letter designation assigned to the cargo in the Chemical Hazards Response Information System (CHRIS) Manual. Chem Codo Certain mixtures of cargoos may not have a CHRIS Code assigned.

Compatability Group No.

Official #: 1224575

ne cargo reactive group number assigned for compatibility determinations in 46 CFR Part 150 Tables I and II. In accordance with 46 CFR 150.130, the Person-in-Charge of the barge is responsible for ensuring that the compatibility requirements of 46 CFR Part 150 are met. Cargoes must be checked for compatibility using the figures, tables, and appendices of 46 CFR 150 in conjunction with the assigned reactive group number.

Because of the very high reactivity or unusual conditions of carriage or potential compatibility problems, this product is not assigned to a specific group in the Compatibility Chart. For additional compatibility information, contact Commandant (CG-3PSO-3), U.S. Coast Guard, 2100 Second Street, SW, Washington, DC 20593-0001. Telephone (202) 372-1425.

Note 2

See Appendix I to 46 CFR Part 150 - exceptions to the compatability chart.

Subchapter Subchapter D Subchapter O Note 3

The subchapter in Title 46 Code of Federal Regulations under which the cargo has been classified.

Those flammable and combustible liquids listed in 46 CFR Table 30.25-1.
Those hazardous cargoes listed in 46 CFR Table 151.05 and 46 CFR Part 153 Table 2.
Those cargoes listed in 46 CFR Part 153 Table 2 are non-regulated cargoes when carried in bulk on non-oceangoing barges.

The cargo classification assigned to each flammable or combustible figuid. Grades inside of "()" indicate a provisional assignment based upon literature sources which were not verified by manufacturers date. The Person-in-Charge shall verify the cargo grade based on Manufacturers date and ensure that the barge is authorized for carriage of that grade of cargo.

Flammable liquid cargoes, as defined in 46 CFR 30-10.22.

Combustible liquid cargoes, as defined in 46 CFR 30-10.15.

The flammability/combustibility grade of these cargoes may vary depending upon the flashpoint and Reid vapor pressure. The Person-in-Charge shall verify the cargo grade based on Manufacturers date and ensure that the barge is authorized for carriage of that grade of cargo.

Those subchapter O cargoes which are not classified as a flammable or combustible liquid.

No flammability/combustibility grade has been assigned yot as the necessary flash point/vapor pressure date for such assignments are presently not available.

A, B, C Note 4

Hull Type

[]]

The required barge hull classification for carriage of the specified Subchapter O hazardous material cargo, see 46 CFR 151.10-1.

Designed to carry products which require the maximum preventive measures to preclude the uncontrolled release of the cargo. See 48 CFR 151.10-1(b)(1).

Designed to carry products which require significant preventive measures to preclude the uncontrolled release of cargo. See 46 CFR 151.10-1(b)(3).

Designed to carry products of sufficient hazard to require a moderate degree of control. See 46 CFR 151.10-1(b)(4).

Not applicable to barges certificated under Subchapter D.

Conditions of Carriage

Tank Group Vapor Recover Approved (Y or N) The vessel's tank group (as defined in Section 4) which is authorized for carriage of the named cargo.

Yes: The vessel's VCS has been reviewed and approved by the MSC to control vapors of the specified cargo. No: The vessel's VCS has been reviewed and is not approved by the MSC to control vapors of the specified cargo.

Conditions of Carriage

Tank Group Vapor Recove Approved (Y or N) The vesset's tank group (as defined under the "46 CFR Tank Group Characteristics" listed on page 1) which is authorized for carriage of the named cargo.

Yes: The vessel's VCS has been reviewed and approved by the MSC to control vapors of the specified cargo. No; The vessel's VCS has been reviewed and is not approved by the MSC to control vapors of the specified cargo.

VCS Category:

The specified cargo's provisional classification for vapor control systems.

Category 1

(No additional VCS requirements above those for benzene, gasolines and crude oil) All requirements applying to the handling of oil and hazardous materials in Titles 33 and 46 Code of Federal Regulations (CFR) apply to these cargoes. Those specifically dealing with vapor control systems are in 33 CFR 155.750, 33 CFR 156.120, 33 CFR 156.170, 46 CFR 35.35 and 46 CFR 39. The cargo tank venting system calculations (46 CFR 39.20-11) and the pressure drop calculations (46 CFR 39.30-1(b)) must use appropriate friction factors, vapor densities and vapor growth rates.

Category 2

(Polymerizes) Polymerization and residue build-up of these cargoes can adversely affect the vessel by fouting safety components and restricting vapor flow which could lead to cargo tank overpressurization. The vessel's owner must develop a method of ensuring all VCS safety components are functional and polymer build-up is not causing an unsafe condition due to increased pressure in the vapor control piping and cargo tanks. The method shall be acceptable to the local Officer in Charge, Marine Inspection. This is in addition to the requirements of Category 1. Please note that a material not normally considered a monomer can be a problem in detonation arrester.

Category 3

(Highly toxic) VCSs for these toxic cargoes cannot use a splil valve or rupture disk as the primary means to meet the overfill protection requirement of 46 CFR 39.20-9. This requirement is in addition to the requirements of Category 1.

Category 4

(Polymerizes and highly toxic) Must comply with requirements of Categories 1, 2 and 3.

Category 5

(High vapor pressure) VCS pressure drop calculations for cargoes with a vapor pressure greater than 14.7 psia at 115 F must take into account increased vapor-air mixture densities and vapor growth rates as compared to Category 1 cargoes. Consult the Marine Safety Center's VCS Guidelines for further information. This requirement is in addition to the requirements of Category 1.

Category 6 Category 7 (High vapor pressure and highly toxic) Must comply with requirements of Categories 1, 3 and 6. (High vapor pressure and polymerizes) Must comply with requirements of Categories 1, 2 and 5.

. The cargo has not been evaluated/classified for use in vapor control systems.