

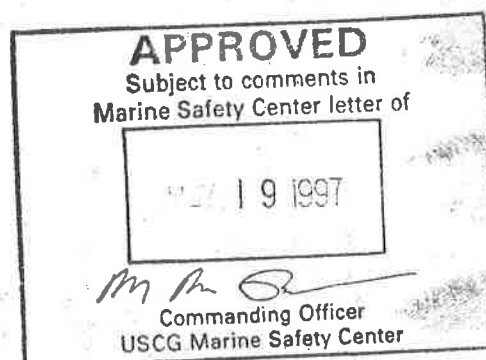
VAPOR CONTROL SYSTEM INSTALLATION

HULL
FOR ~~BARGE~~: "E344"

CONOCO, INC.

APRIL 14, 1997

BARGE: "7026"



ENCLOSURE (1)

PREPARED BY: SHEARER & ASSOC., INC.
P. O. BOX 9576
METAIRIE, LA 70055
(504) 836-6009

II. BARGE TYPE AND DESCRIPTION:

The vessel of concern is a 297'-6" X 54'-0" X 12'-0", double side, double bottom, tank barge intended for service on rivers, lakes, bays and sounds. It is equipped with a raked end and a box end. It has six (6) cargo tanks, and is served by a cargo pump, and a transverse load and unload header.

III. INDIVIDUAL BARGE DATA:

<u>NAME</u>	<u>BUILDER</u>	<u>HULL</u>
7026 E344	TRINITY/PLATZER	E344

IV. CARGO PRODUCT(S):

The vapor control system is to be used with cargo product(s) listed in APPENDIX E and as otherwise authorized by U.S.C.G.

V. CARGO HOSES:

The vessels will not carry cargo vapor hoses. Accordingly, and with reference to 46 CFR 39.30-1(c), hoses are not included in the pressure drop calculations presented by this analysis.

VI. MAXIMUM DESIGN WORKING PRESSURE:

Per previous documentation the barge structure is reported to be suitable for a 3.0 PSIG MAXIMUM DESIGN WORKING PRESSURE.

(Note: This MAXIMUM DESIGN WORKING PRESSURE is considered appropriate for both pressure and vacuum conditions.)

VII. MAXIMUM LIQUID TRANSFER RATE:

The maximum liquid transfer rate (MLTR) is to be 5,000 BBL/HR unless otherwise limited by (1) the max capacity of the cargo tank venting system (see APPENDIX E-3), or (2) by the sum of the "shore connection pressure" plus the "pressure drop" from the most remote tank to the shore connection being in excess of 80% of the P/V setting as determined from the graphs of APPENDIX G for specific loading conditions.

VIII. VAPOR CONTROL SYSTEM (46 CFR 39.20-1):

FIGURE 1 and TABLE LM-1 provide a diagram and list of material, respectively, of the vapor control system and related equipment.

When the vapor control system is to be used:

A. Pressure/vacuum valves (if any) other than the vapor control system pressure/vacuum valve(s) will be removed and the connections sealed with standard threaded pipe caps or equal.

B. Above-deck vapor piping will be lettered and painted in accordance with 46 CFR 39.20-1(d).

C. The shore connection flange will be in accordance with 46 CFR 39.20-1(f).

IX. CARGO GAUGING SYSTEM:

A. One (1) visual tank level indicator (i.e., sight glass) will be installed at the access hatch to each cargo tank to provide liquid level determination in accordance with 46 CFR 39.20-3(a). Descriptive literature is provided in TABLE LM-1 and in APPENDIX A.

B. One (1) high level indicating device (i.e., dipstick) will be installed in each cargo tank to indicate when the liquid level in the cargo tank is within about 3.28 feet of the tank top in accordance with 46 CFR 39.20-3 (b). Descriptive literature is provided in TABLE LM-1 and in APPENDIX B.

X. LIQUID OVERFILL PROTECTION (46 CFR 39.20-9):

Primary tank barge liquid overfill protection will be provided by installation of a high level alarm/shutdown system which complies with the requirements of 46 CFR 39.20-9 (b). Additional tank barge liquid overfill protection will be provided by installation of spill valves ~~installed over rupture disks~~, which comply with the requirements of 46 CFR 39.20-9(d). Each spill valve will serve two (2) cargo tanks (P/S) by use of an adapter. Descriptive literature on both protection measures is provided in TABLE LM-1 and in APPENDIX C.

Calculations for the allowable flow of the spill valve (without exceeding the MAX DESIGN WORKING PRESSURE) are provided as APPENDIX I; however, these flow rates do not govern the MAX LIQUID TRANSFER RATE since primary liquid overfill protection is provided by the high level alarm and shutdown system.

APPENDIX J provides a summary comparison of the spill valve and the P/V transfer rates.

XI. VAPOR OVERPRESSURE AND VACUUM PROTECTION (46 CFR 39.20-11):

To satisfy the requirements of 46 CFR 39.20-11, the cargo tank venting system is to be fitted with one (1) pressure vacuum relief valve. Descriptive literature is provided in TABLE LM-1 and in APPENDIX D. It will be installed in the above deck vapor control piping.

A. VAPOR OVERPRESSURE (LOADING) PROTECTION

APPENDIX E develops the maximum liquid (cargo loading) transfer rate for which the pressure in the cargo tank most remote from the P/V valve does not exceed the MAXIMUM DESIGN WORKING PRESSURE. The calculations therein are in general accordance with the USCG-provided GUIDELINES FOR DETERMINING THE MAXIMUM LIQUID TRANSFER RATE FOR A TANK VESSEL TRANSFERRING A FLAMMABLE OR COMBUSTIBLE CARGO USING A VAPOR CONTROL SYSTEM.

B. VAPOR VACUUM PROTECTION

It is possible that cargo loading may suddenly be stopped while the shore facility compressor continues to draw a vacuum. In that instance, the P/V valve is required to have sufficient vacuum capability to intake air in quantity equal to the MAXIMUM LIQUID TRANSFER RATE at a pressure (vacuum) which does not exceed the MAXIMUM DESIGN WORKING VACUUM.

With reference to the vacuum curve information in APPENDIX D, the P/V valve has the following vacuum capacity at a vacuum of -1.0 PSIG, a pressure which is less than the -3.0 PSIG MAXIMUM DESIGN WORKING VACUUM:

CARGO PRODUCT WITH HIGHEST REQ'D AIR FLOW RATE	HIGHEST REQUIRED AIR FLOW RATE (MATR)		PV VALVE VACUUM CAPACITY AIR	
	(BBL/HR)	(FT ³ /HR)	(BBL/HR)	(FT ³ /HR)
	<u>VARIOUS</u>	<u>5,000</u>	<u>28,074</u>	<u>5,877 33,000</u>

Since the capacity at higher vacuum exceeds the highest required air flow rate, the cargo tank venting system will:

a. Prevent a vacuum in the cargo tank vapor space, whether generated by withdrawal of cargo or vapor at maximum rates, that exceeds the MAXIMUM DESIGN WORKING VACUUM for any tank connected to the vapor collection system; and

b. Not relieve at a vacuum corresponding to a vacuum in the cargo tank vapor space of less than 0.5 PSIG below atmospheric pressure.

XII. OPERATIONAL REQUIREMENTS (46 CFR 39.30-1):

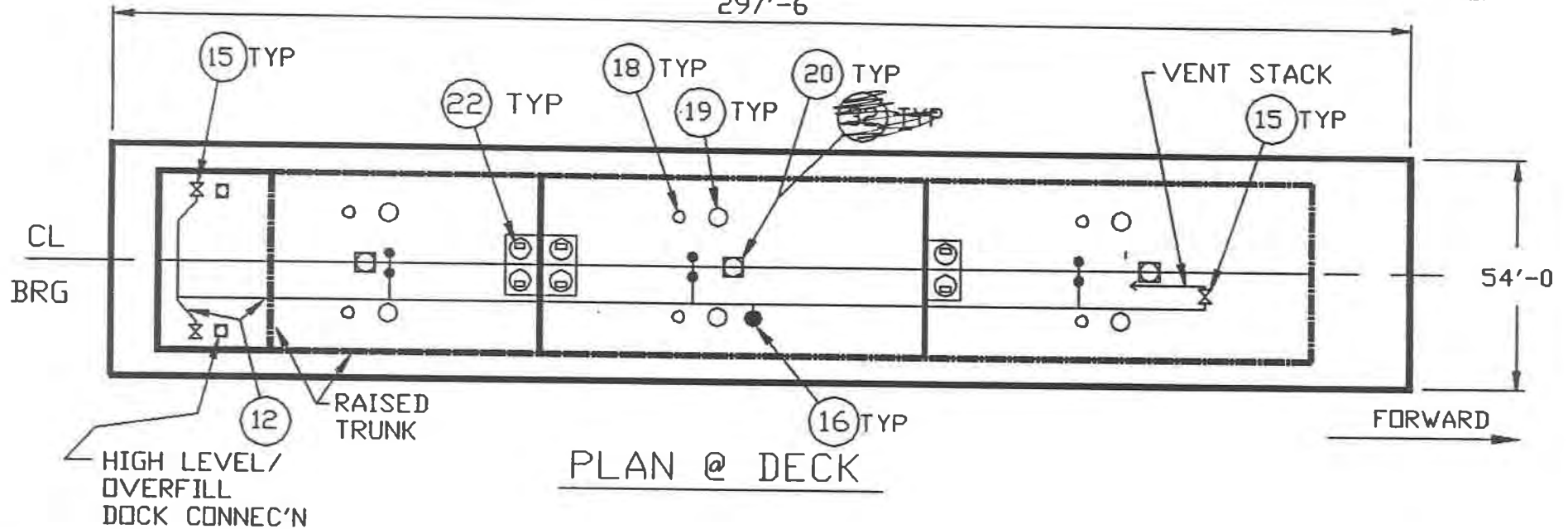
To satisfy the requirements of 46 CFR 39.30-1(b) and (d), data is developed showing the relationship between "pressure drop" through the vapor control system from the most remote cargo tank to the vessel shore connection and "liquid transfer rate" for various values of vapor-air mix growth rate, vapor-air mix specific gravity, and pressure at the shore connection.

Detailed support calculations for the data are voluminous, and repetitive. Accordingly, an illustrative sample calculation and graph (vice complete calculations and graphs for all individual products) are provided as APPENDIX F. The calculation procedure is in general accordance with the USCG-provided GUIDELINES FOR DETERMINING THE MAXIMUM LIQUID TRANSFER RATE FOR A TANK VESSEL TRANSFERRING A FLAMMABLE OR COMBUSTIBLE CARGO USING A VAPOR CONTROL SYSTEM. Output results from the complete calculations are presented in the graphs of APPENDIX G. Further, a listing is provided, by cargo, of the pressure drop from the most remote cargo tank to the shore connection for a 1.0 PSIG pressure at the shore connection. Descriptive literature similar to those graphs and table is to be included in the vessel "TRANSFER PROCEDURES" by the owner-operator.

CONOCO, INC.
 BARGE NAME: ~~E344~~ 7026

297'-6

(NOT TO SCALE)



PIECE MARK	DESCRIPTION
12	PIPING (8")
15	SHUTOFF VALVE (8")
16	PV VALVE
22	VISUAL TANK LEVEL INDICATOR (SIGHTGLASS)
18	HIGH LEVEL INDICATOR (DIPSTICK)
19	HIGH LEVEL SENSOR ALARM & SHUTDOWN DEVICE
20	SPILL VALVE
20	SPILL VALVE

DIAGRAM OF VAPOR CONTROL SYSTEM
FIGURE 1

VAPOR CONTROL SYSTEM INSTALLATION

FOR BARGE: ~~E244~~ 7026

CONOCO, INC.

TABLE LM-1
LIST OF MATERIAL
FOR VAPOR CONTROL SYSTEM

PIECE MARK	ITEM	QTY	SIZE	SPECIFICATION
12	PIPING FITTINGS FLANGES		8"	SCHED 40, STEEL, ASTM A-53 OR A-106 GRADE B 2" & SMALLER: 3000# FORGED STEEL SCR'D ASTM 105; AND 2 1/2" & LARGER: BUTT WELD SCHED 40 ASTM A234 GR B, ANSI B-16.9 150# SLIP-ON OR WELD NECK FLANGES, STEEL ASTM A-105, ANSI B-16.5; AND/OR 150# FF WELD NECK FLANGES, ASTM A 181
15	VALVE	3	8"	BUTTERFLY VALVE, STEEL W/S.S. TRIM, KEYSTONE OR EQUAL, 150#
16	P.V. VALVE	1	8"	MIDLAND, MODEL A-883, S.S., SET AT 1.5 PSIG PRESSURE, & -0.5 PSIG VACUUM
18	HIGH LEVEL INDICATING DEVICE	6	N/A	MIDLAND MODEL B-610, MAGNETIC DIPSTICK, 300 SERIES STAINLESS STEEL WETTED PARTS
19	HIGH LEVEL SENSOR ALARM & SHUTDOWN SYSTEM	1	N/A	MIDLAND MODEL B-595 TANK HIGH LEVEL AND OVERFILL SENSOR (ONE SENSOR IN EACH TANK)
20	SPILL VALVE	3	10"	MIDLAND MODEL A-7103, SET @ 1.75 PSIG
22	VISUAL TANK LEVEL INDICATOR	6	N/A	ERL MODEL SGM-1 MARINE SIGHT GLASS
23	PAINTWORK	1	1pm	

Jan '75



ERL

MARINE PRODUCTS DIVISION

MARINE SIGHT GLASS

U.S. PATENT NO. 5,284,105

**FULL-VIEW
Model SGM-1**

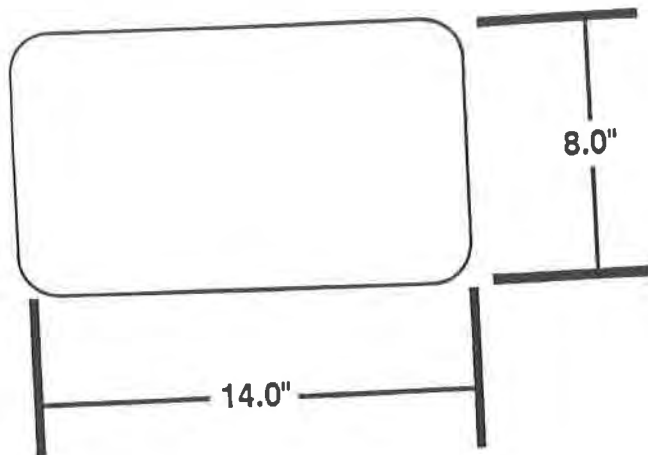


You will notice immediately that ERL has done something radically different with the new SGM-1. Starting with a "clean sheet of paper" and state-of-the-art CAD technology ERL set out to create a marine sight glass that would be better than the best. The SGM-1 gives the largest and clearest sealed-view into your cargo hold, for the money, of any marine sight glass on the market.

COMPARE THESE FEATURES TO THE OTHER MARINE SIGHT GLASSES.

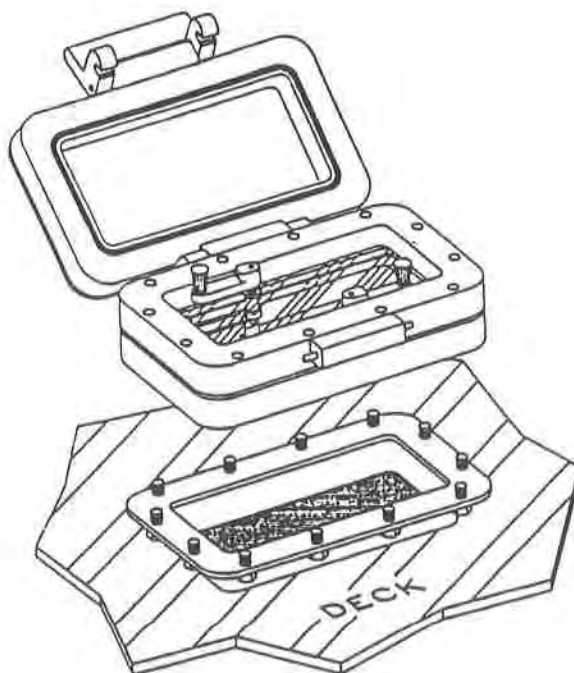
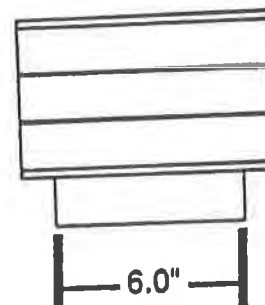
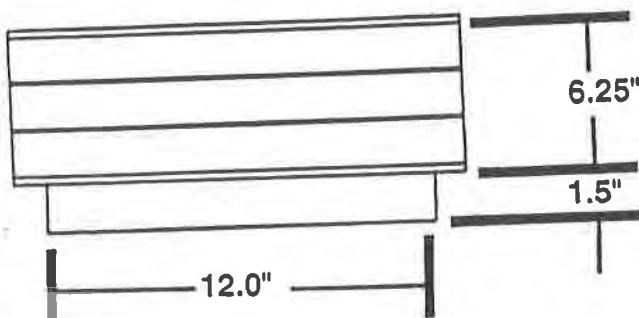
- * A full 59 Sq. Inches of viewing area (34 Sq. Inches is wiped). Wiper blades can be readily changed and are standard size, off-the-shelf, Viton or EPDM "O" rings.
- * 3/4" thick #7740 Pyrex ground and polished plate glass is stress relieved with ground edges and radiused corners.
- * The SGM-1 and all mounting hardware is 303 Stainless Steel except for the aluminum glass cover and the carbon-steel deck mounting flange. All gaskets (supplied) are industrial quality Teflon or Buna N.
- * The SGM-1 is the easiest, safest and most economical way to comply with USCG regulations on Marine Vapor Control Systems by giving the clearest visual gaging/inspection of your cargo.
- * The unique carbon-steel deck mounting flange makes shipyard installation easy and prevents damage to the sight glass, which can occur during installation of ordinary weld-in-place sight glasses.

SPECIFICATIONS



Marine Sight Glass Model SGM-1

Weight	=	58 lbs.
Viewing Area	=	59 Sq. In.
Wiped Area	=	34.1 Sq. In.



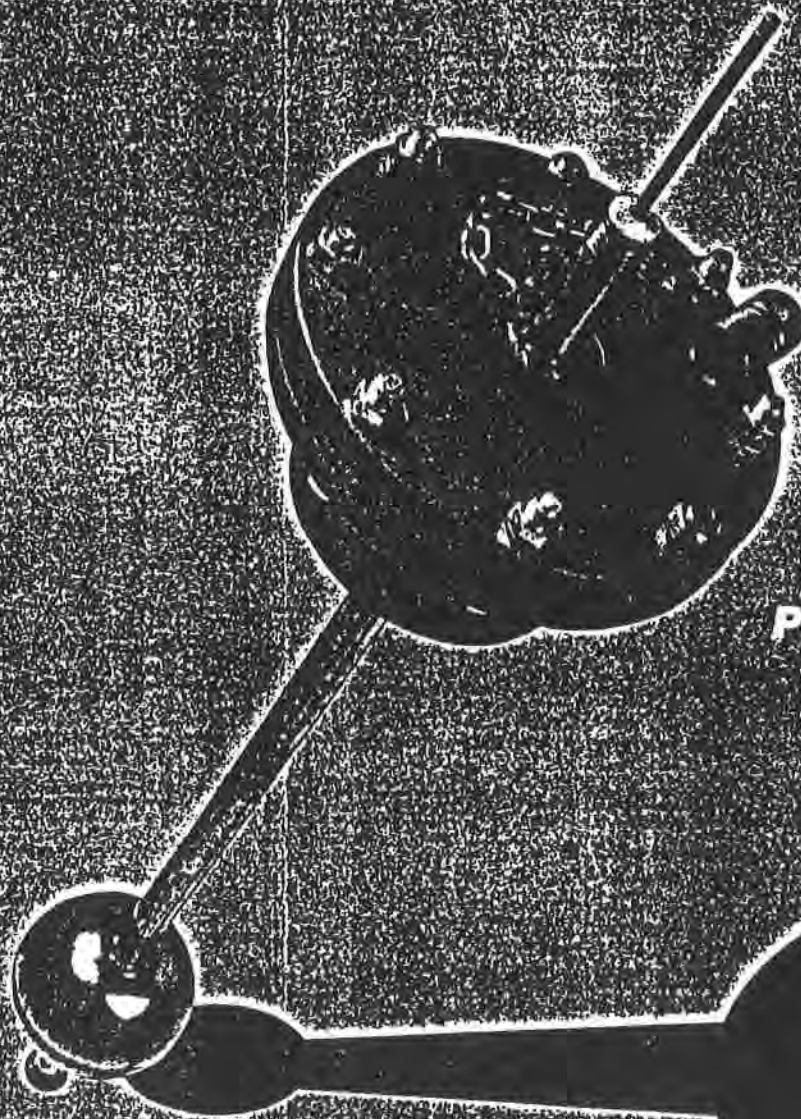
ERL MARINE PRODUCTS DIVISION
P.O. BOX 1026
NEW ALBANY, IN 47151-1026

1-800-831-9510
FAX 1-812-944-8808

NEW from
the MARINE
DIVISION of
MIDLAND
MANUFACTURING

Dec 93

**THE
B-610
-AN
UNMATCHED
HIGH LIQUID
LEVEL
INDICATOR
FOR
RELIABLE
PERFORMANCE
AND
SIMPLIFIED
INSTALLATION**



**30 years experience
is behind the design of the
B-610 for tank barges,
container vessels and tankers.**

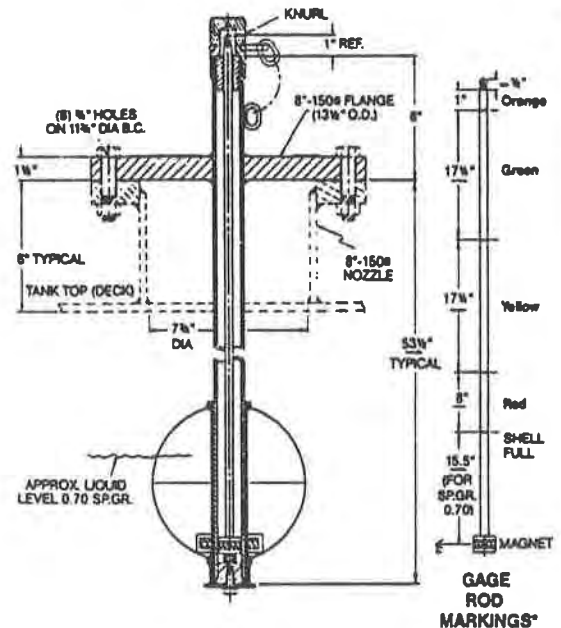
Midland's new high liquid level indicator for marine applications is a refinement of a gage design proven in the most demanding kinds of service. You can depend on it for exceptional accuracy, durability and vapor emission control—plus fast, economical installation. Complies with CFR 39.20-3(b)(1) U.S.C.G. Regulations. Approved for use on Coast Guard certificated vessels.

MIDLAND B-610/Principles of Operation

1. A rigid teflon-covered indicator gage rod, color-coded to industry standards, incorporates a powerful magnet at its base.
2. The gage rod moves up and down inside a 1½" O.D. stainless steel tube (comparable to extra strong pipe) that is sealed to prevent product from the tank entering the tube.
3. As the product rises in the upper level of the tank, a high strength (pressure-tested to 400 psi) spherical stainless steel float moves up the outside of the sealed tube.
Recessed in the float is a high-intensity ring magnet. The magnetic linkage between the float and the rod causes them to move together. As the product level in the tank increases, the rod rises accordingly—and its color code alerts the tankerman to retard the loading rate and stop in time to prevent possible overfilling.
4. When loading is completed, the indicator gage rod is pushed down to rest at the bottom of the stainless steel tube; and a protective weather cover is put back in place on top of the gaging device housing.

MIDLAND B-610/Key Design Features

- A. Exceptionally high-strength magnets avoid accidental separation of the rod and float.
- B. The float and rod are magnetically linked as soon as the float begins to rise. Consequently, there is no need for the tankerman to engage the rod.
- C. 300 series stainless steel wetted parts assure complete corrosion resistance to most types of commodities.
- D. Heavy-duty float and gage tube will withstand forces generated by surges, impact or Butterworth cleaning operations.
- E. The extra-large 7½" diameter float remains buoyant in all services—even down to .51 specific gravity (e.g. propane).
- F. Our standard mounting is an 8"-150# ANSI (or ASA) heavy-duty steel flange. Alternative mountings and sizes are available.
- G. In addition, a companion 8" nozzle can be supplied. This is designed to be welded to the tank from the outside, eliminating any need for internal welding and scaffolding.
- H. The protective stainless steel weather cover can be removed by hand. The cover is chained to the housing to prevent misplacement.
- I. The gage rod, when equipped with additional magnets, can activate audible and visible signals, as well as system shutdown when used in conjunction with Midland B-594 or B-596 sensors. (U.S. Patent No. 4,924,703)



For more details and prompt service,
please write or call...



7733 Gross Point Road
Skokie, IL 60077
(708) 677-0333
Telex 28-9429
FAX # (708) 677-0138



Midland Model B-595

TANK HIGH LEVEL AND OVERFILL SENSOR

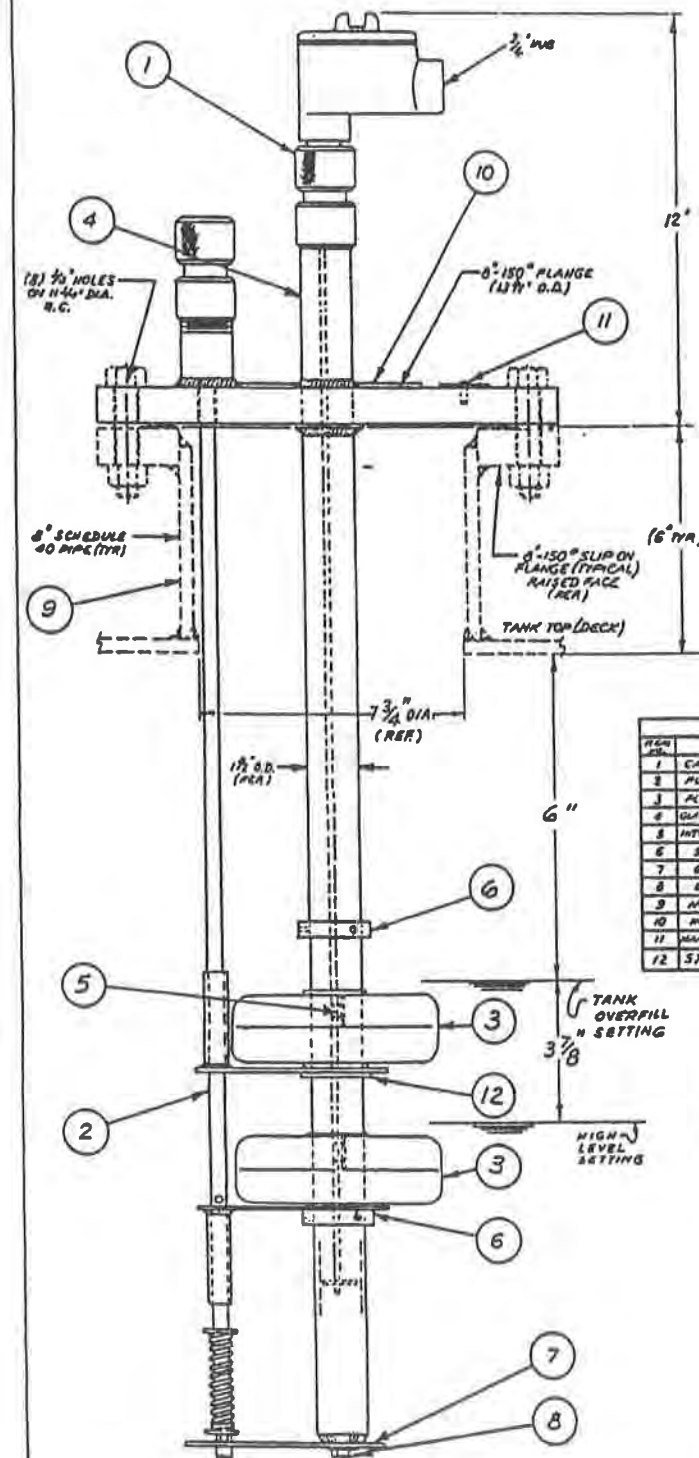


Intrinsically safe dual level alarm sensors provide independent HIGH LEVEL alarm and tank OVERFILL alarm signals to Barge Inlet connector. An 8" 150# ANSI mounting flange with integral float guide tube allows single point access for both HIGH LEVEL and OVERFILL alarm sensors. A stainless steel manual lifting handle sequentially checks float travel freedom and alarm function for each float. Approved for use on Coast Guard certificated vessels.

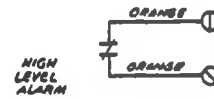
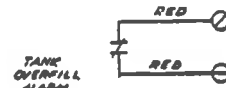
SPECIFICATIONS:

Operation:	Each alarm sensor is activated independently by a dedicated float.
Sensor:	Form C Contact (SPDT) Contact Rating - 24 Vdc @ 250 mA max Contact Resistance - 0.200 ohms max Shock without False Operation - 100 g's Operating Temperature - 40 to +105 C Cycle Life - 40,000,000 Sensor meets Mil Spec S 554433C
Materials of Construction:	All stainless steel wetted parts, including mounting flange with Explosion Proof watertight conduit.





WIRING DIAGRAM



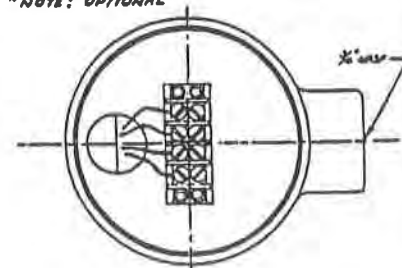
CONTACTS SHOWN IN NON-ALARM CONDITION

PROXIMITY SENSOR SPECIFICATIONS

CONTACT FORM C (SPST)
 CONTACT RATINGS 24 VDC @ 250 MA MAX.
 CONTACT RESISTANCE 0.200 OHMS MAX.
 SHOCK WITHOUT FALSE OPERATION 100 G'S
 OPERATING TEMPERATURE -40 TO +125 °C
 CYCLE LIFE 10,000,000
 PER MIL. SPEC E 53433 C
 UL RECOGNIZED COMPONENT -
 FILE E 61760
 CSA FILE LR 43615-2

ITEM NO.	PART NAME	MATERIAL	QTY.	PART NO.
1	CAP/OUTLET BOX	STAINLESS STEEL	1	535-1-25
2	FLOAT ARM ASSEMBLY	STAINLESS STEEL	1	535-2-25
3	FLOAT W/MAGNET	STAINLESS STEEL	2	535-3-25
4	GUIDE TUBE & FLANGE ASSY.	STAINLESS STEEL	1	535-4-25
5	INTERNAL SENSOR ASSY.	PLASTIC & WIRE	1	535-5-25
6	STOP COLLAR	STAINLESS STEEL	2	535-6-25
7	GUIDE PLATE	STAINLESS STEEL	1	535-7-25
8	BOLT, LEVER	STAINLESS STEEL	1	610-8-25
9	WHEEL ASSEMBLY	STEEL	1	610-9-25
10	INSTRUCTION PLATE	PLASTIC	1	535-10-25
11	MAINPLATE W/DRIVE SCREWS	STAINLESS STEEL	1	535-11-25
12	STOP RING	STAINLESS STEEL	1	535-12-25

*NOTE: OPTIONAL



OUTLET BOX TOP VIEW

MEETS 46 CFR 39.20-7

MIDLAND MODEL B-595

ENERGY STORED IN AN INDUCTOR $\frac{LI^2}{2}$ JOULES*

ENERGY STORED IN A CAPACITOR $\frac{CV^2}{2}$ JOULES*

WHERE: L = HENRYS
I = AMPERES
C = FARADS
V = VOLTS

GIVEN SPECIFICATIONS:

- 1) API RECOMMENDED PRACTICE 1125, FEBRUARY 1991, PARA 2.3.3
MAXIMUM VOLTAGE 20.66 VOLTS D.C.
MAXIMUM CURRENT 155 MILLIAMPS
- 2) CFR 39.20-9(b)(4) MAXIMUM LIMIT OF 20 MICROJOULES OF STORED ENERGY.

GIVEN TEST DATA:

TYPICAL MEASURED VALUES FOR B-594 OR B-595 SENSOR CIRCUIT.
INDUCTANCE 1.5 MICROHENRYS
CAPACITANCE 18 PICO FARADS

FIND: STORED ENERGY IN SENSOR CIRCUIT.

CALCULATIONS:

$$\begin{aligned}\text{INDUCTIVE ENERGY } \frac{LI^2}{2} \text{ JOULES} &= \frac{(1.5 \times 10^{-6})(155 \times 10^{-3})^2}{2} \\ &= 18.018 \times 10^{-12} \text{ JOULES} = \underline{0.0180} \text{ MICROJOULES}\end{aligned}$$

$$\begin{aligned}\text{CAPACITIVE ENERGY } \frac{CV^2}{2} \text{ JOULES} &= \frac{(18 \times 10^{-12})(20.66)^2}{2} \\ &= 3841 \times 10^{-12} \text{ JOULES} = \underline{.0038} \text{ MICROJOULES}\end{aligned}$$

GIVEN TEST DATA:

TYPICAL MEASURED VALUES FOR AN EIGHT TANK BARGE CIRCUIT WITH B-594 OR B-595 SENSORS:
INDUCTANCE .195 MILLIHENRYS
CAPACITANCE 1880 PICO FARADS

FIND: STORED ENERGY IN THE EIGHT TANK BARGE CIRCUIT.

CALCULATIONS:

$$\begin{aligned}\text{INDUCTIVE ENERGY} &= \frac{LI^2}{2} \text{ JOULES} \\ &= \frac{(.195 \times 10^{-3})(155 \times 10^{-3})^2}{2} \\ &= 2342 \times 10^{-9} \text{ JOULES} = \underline{2.342} \text{ MICROJOULES}\end{aligned}$$

$$\begin{aligned}\text{CAPACITIVE ENERGY } \frac{CV^2}{2} \text{ JOULES} \\ &= \frac{(1880 \times 10^{-12})(20.66)^2}{2} \\ &= 401225 \times 10^{-12} \text{ JOULES} = \underline{0.4012} \text{ MICROJOULES}\end{aligned}$$

FIND: TOTAL STORED ENERGY

$$2.342 \text{ MICROJOULES} + .401 \text{ MICROJOULES} = 2.743 \text{ MICROJOULES.}$$

CONCLUSION: PER CRF 39.20-9(b)(4) THE TOTAL STORED ENERGY MAXIMUM LIMIT OF 20 MICROJOULES IS NOT EXCEEDED BY THE CALCULATED VALUE OF 2.743 MICROJOULES.

*NOTE: REFERENCE - ELECTRONIC DESIGNERS' HANDBOOK MC GRAW HILL 1957 pp 1-3

MIDLAND MFG. CORP.
SKOKIE, ILL.

STORED ENERGY CALCULATIONS FOR
COMPLIANCE WITH 46 CFR 39.20-9(b)(4)

SK 062591

DRAWN BY:
GB/RHD

REVISION:

SCALE:

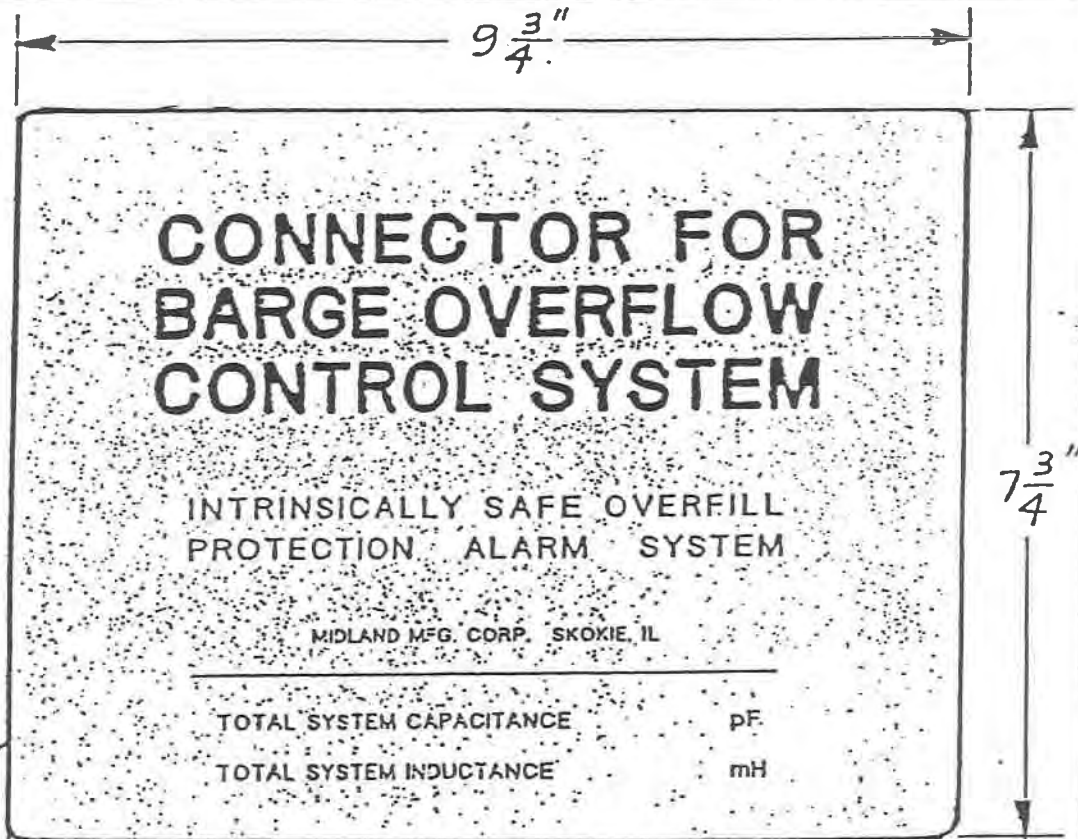
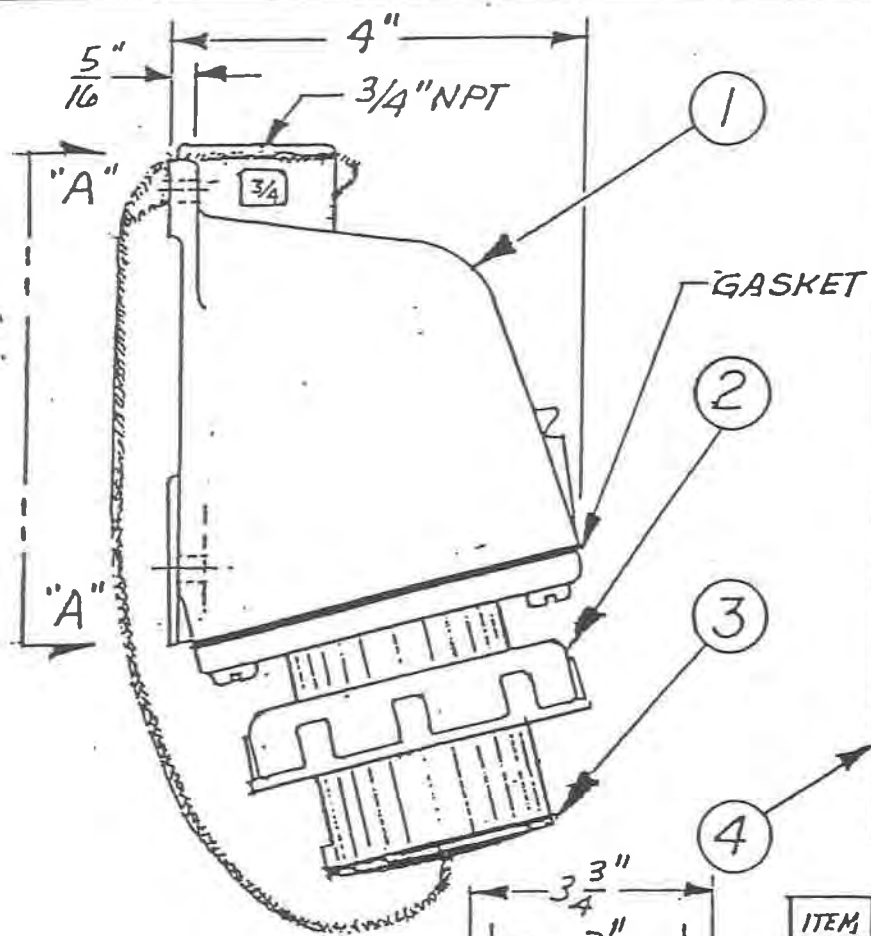
DATE:

6-25-91

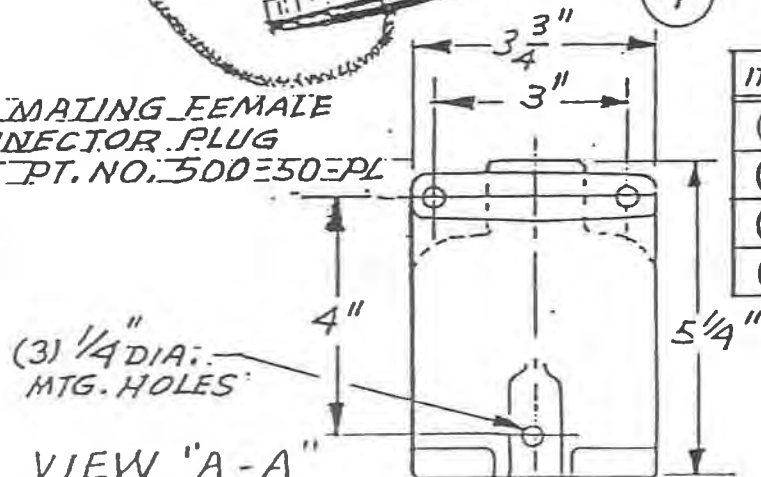
MATERIAL:

REMOVE ALL BURRS.
BREAK ALL EDGES & CORNERS

STD. TOLERANCES:
UNLESS SPECIFIED
DECIMAL $\pm .005$
FRACTIONS $\pm .015$



FOR MATING FEMALE
CONNECTOR PLUG
USE PT. NO. 500-50-PL



VIEW "A-A"
NO SCALE

ITEM	PART NAME	MATERIAL	QTY.	PART NO.
①	ANGLE BACK BOX	CAST ALUMINUM	1	500-10-AL
②	FLANGED MALE INLET	PLASTIC AND METAL	1	500-11-PL
③	CLOSURE PLUG W/ CORD	RUBBER & NYLON	1	500-12-BN
④	PLACARD	UV STABILIZE PLASTIC 1/16" THICK	1	500-41-PL

MATERIAL:
SEE B/M

REMOVE ALL BURRS.
BREAK ALL EDGES & CORNERS

STD. TOLERANCES:
UNLESS SPECIFIED

MIDLAND MFG. CORP.
SKOKIE, ILL

BARGE INLET

SCALE:
HALF

DRAWN BY:
KITS M.

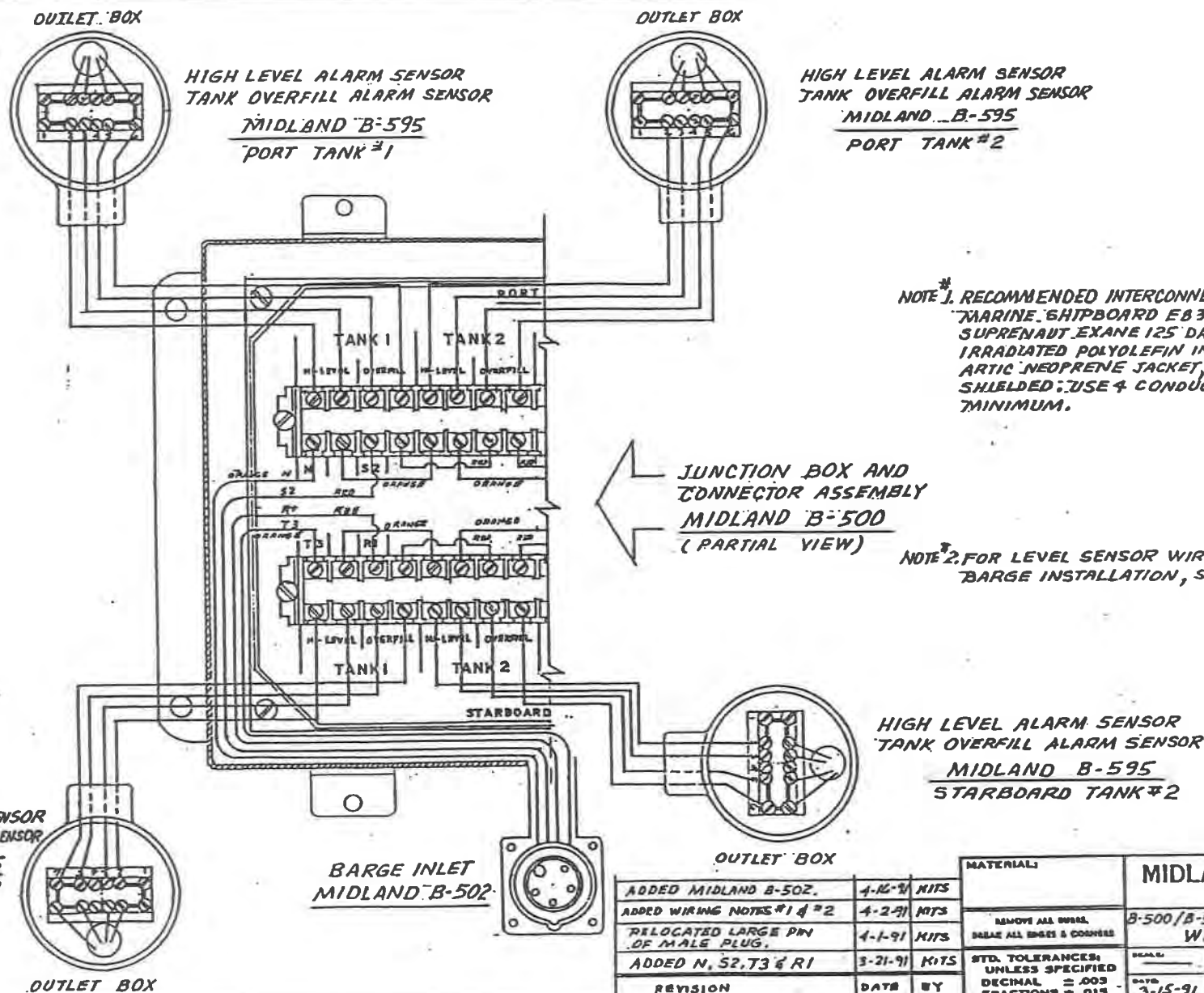
R-502

ADDED MATING PLUG NOTE.

5/8/91 K.M.

C-1-e

C-1-5



ADDED MIDLAND B-502.	4-16-91	KITS
ADDED WIRING NOTES #1 & #2	4-2-91	MIS
RELOCATED LARGE PIN OF MALE PLUG.	4-1-91	KITS
ADDED N, S2, T3 & R1	3-21-91	KITS
REVISION	DATE	BY

MATERIAL:		MIDLAND MFG. CORP.	
REMOVE ALL DIMS. SCALE ALL DIMS & CORNERS		SKOKIE, ILL.	
STD. TOLERANCES: UNLESS SPECIFIED DECIMAL ± .003 FRACTIONS ± .015		B-500/B-595 INTERCONNECTION WIRING DIAGRAM	
DATE 3-15-91	DESIGN 4-16-91	DRAWN BY KITS M.	B-500-1

MIDLAND B-500 JUNCTION BOX (USED WITH B-595) OR MIDLAND B-501 JUNCTION BOX (USED WITH B-594).

INTRINSICALLY SAFE OVERFILL PROTECTION ALARM SYSTEM

B-500 INSTRUCTIONS: READ AND OBEY. 400°F. 5000 PSI. 10000 PSI.

MIDLAND B-594 OR B-595 SENSORS

PORT

MIDLAND B-594 OR B-595 SENSORS

STARBOARD

CONDUIT OUTLET BOX MIDLAND 502-8

MIDLAND B-502 BARGE INLET

MIDLAND B-502 BARGE INLET

CONNECTOR FOR BARGE OVERFLOW CONTROL SYSTEM

LOCATE BARGE INLETS WITHIN 10 FT. OF BARGE LOADING MANIFOLDS PORT AND STARBOARD

NOTE #1.
RECOMMENDED INTERCONNECTION WIRING:
MARINE SHIPBOARD E83358 110°C
SUPRENAUT EXANE 125 DRC 1048C,
IRRADIATED POLYOLEFIN INSULATION,
ARTIC NEOPRENE JACKET,
600V/IEC 1000 V, SHIELDED.

**FOR B-594 USE 2 CONDUCTOR
#18 AWG MINIMUM.**
**FOR B-595 USE 4 CONDUCTOR
#18 AWG MINIMUM.**

NOTE #2.
FOR B-500/B-595 INTERCONNECTION WIRING DIAGRAM, SEE 'DRAWING' B-500-1.

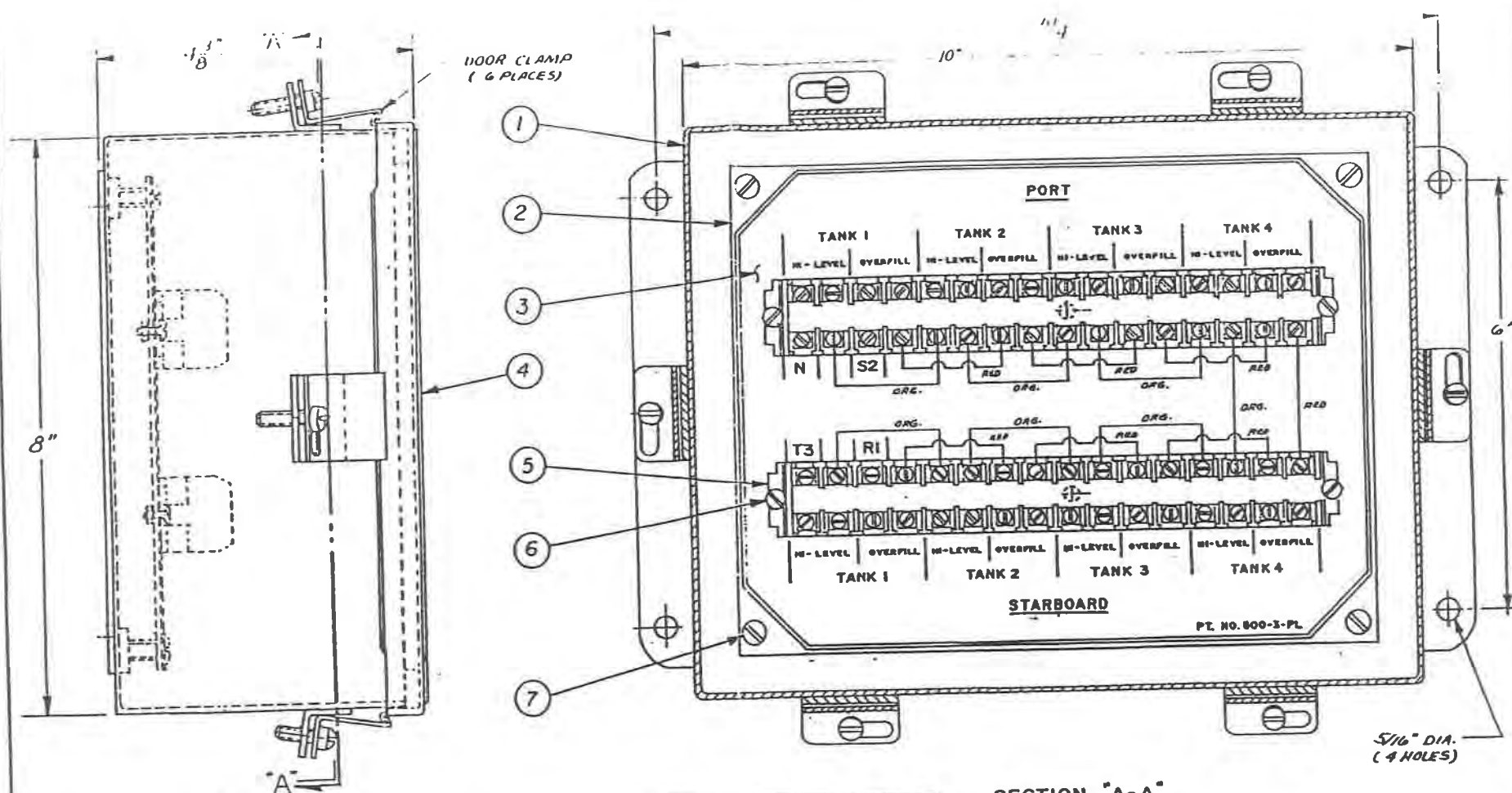
NOTE #3.
FOR B-501/B-594 INTERCONNECTION WIRING DIAGRAM, SEE 'DRAWING' B-501-1.

REFERENCE:
OVERFILL CONTROL SYSTEMS
FOR TANK BARGES
API RECOMMENDED PRACTICE 1125.

ADDED JUNCTION BOX PLYCARD WORKING	1-2-91	NTS
ADDED WIRING NOTES #1, #2, #3	1-2-91	NTS
REVISION	DATE	BY

MATERIAL	MIDLAND MFG. CORP.
REWORK ALL PANELS, DRIVE ALL BOLTS & CONNORS	SHOWERS, R.L.
STD. TOLERANCES UNLESS SPECIFIED DECIMAL ± .005 FRACTIONS ± .015	LEVEL SENSOR WIRING TYPICAL BARGE INSTALLATION
DATE 4-1-91	DRAWN BY: JIM M. CHECKED BY: J. H. N. DATE: 4-18-91
	B-500-2

C-1-2



SIDE VIEW

ITEM	PART NAME	MATERIAL	QTY.	PART NO.
(1)	BOX WITH COVER	STAINLESS STEEL	1	500-1-35
(2)	PANEL	STAINLESS STEEL	1	500-2-55
(3)	PANEL NAMEPLATE	PLASTIC	1	500-3-PL
(4)	COVER NAMEPLATE	PLASTIC	1	500-4-PL
(5)	TERMINAL STRIPS	PLASTIC & METAL	2	500-5-PL
(6)	PAN HEAD SCREW	STAINLESS STEEL	6	500-6-55
(7)	SCREW: LKW, NUT.	STAINLESS STEEL	4	500-7-55

**INTRINSICALLY SAFE
OVERFILL PROTECTION
ALARM SYSTEM**

B-500 JUNCTION BOX
MIDLAND MFG. CORP.
SKOKIE, ILLINOIS

COVER NAMEPLATE

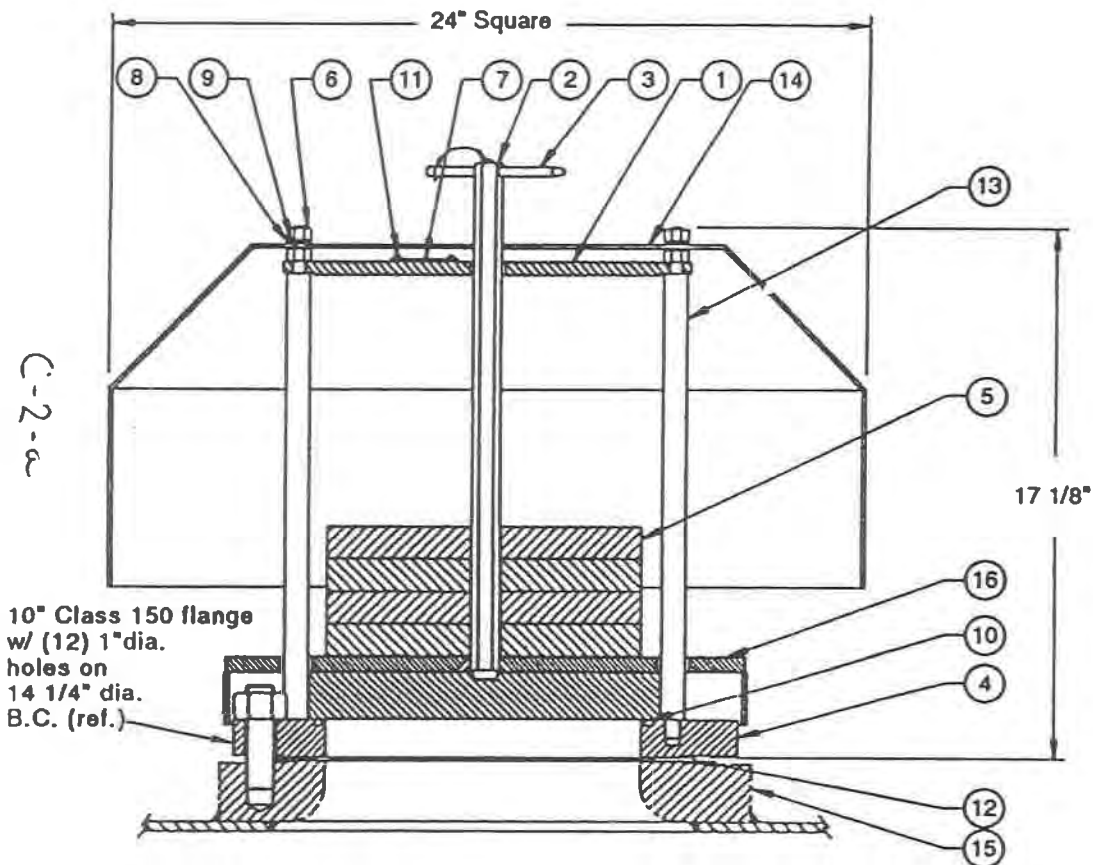
SECTION "A-A"

REMOVED ITEM 8 THRU 13.		4-8-71	ITEM 8	DATE RECD MAY 4X ENCLOSURE		MIDLAND MFG. CORP. CHICAGO, ILL.	
ADDED NOTE		3-22-71	ITEM 9	RECEIVED BY MAY 4X 1971		JUNCTION BOX AND CONNECTOR ASSEMBLY	
ADDED 'USED WITH' NOTE		3-11-71	ITEM 10	STD. TOLERANCES UNLESS OTHERWISE SPECIFIED		FILE MAY 4X 1971	
CHANGED TITLE		1/4/71	ITEM 11			A-500	



MIDLAND MANUFACTURING CORP. SKOKIE, IL. PHONE 708-677-0333 OR FAX 708-677-0138

9/27/93



Maintains set pressure on tank while relieving and automatically recloses vapor tight when pressure is less than 90% of set opening pressure, as required by 7.1.9 of ASTM F 1271.

CERTIFIED AS COMPLYING WITH ASTM F 1271-90 SPECIFICATION

ITEM NO.	QTY.	PART NAME	A-7103	
			MATERIAL	PART NUMBERS
1	1	TOP GUIDE	316 STAINLESS STEEL	7103-1-MO
2	1	POPPET ASSEMBLY	316L STAINLESS STEEL	7103-2-MOL
3	1	PIN	316 STAINLESS STEEL	763-3-MO
4	1	BASE	316 STAINLESS STEEL	7103-4-MO
5	SPECIFY	WEIGHT	316 STAINLESS STEEL	SEE TABLE
6	8	NUT	316 STAINLESS STEEL	763-6-MO
7	1	NAMEPLATE	316 STAINLESS STEEL	763-7-MO
8	8	WASHER	316 STAINLESS STEEL	763-8-MO
9	4	LOCK WASHER	316 STAINLESS STEEL	763-9-MO
10	1	SEAL	VITON ⁽²⁾	7103-10-VA
11	2	DRIVE SCREW	18-8 STAINLESS STEEL	763-11-SS
12	1	GASKET ⁽¹⁾	VITON ⁽²⁾	7103-12-VA
13	4	SHOULDER BOLT	NITRONIC 60	7103-13-SS
14	1	DEFLECTOR	316L STAINLESS STEEL	782-141-MOL
15	1	FLANGE ASSEMBLY ⁽¹⁾	CARBON & STAINLESS STEEL	7103-15-CS/SS
16	1	POPPET SKIRT	316L STAINLESS STEEL	7103-16-MOL

NOTE: 1 Required, order separately. 2 Alternate material available.

SET OPENING PRESSURE (PSI)	SPILL VALVE PART NUMBER	QUANTITY	WEIGHT PART NUMBER	RATED FLOW @ 120% OF SET OPENING PRESSURE 1.0 SP. GR. (BDL/HR.)
1.00	A-7103-16	—	—	4239
1.25	A-7103-20	1	7103-54-MO	4740
1.30	A-7103-21	1	7103-54-MO	4834
		1	7103-51-MO	
1.50	A-7103-24	2	7103-54-MO	5192
1.75	A-7103-28	3	7103-54-MO	5608
2.00	A-7103-32	4	7103-54-MO	5995

For information about other set pressures and flow rates contact Midland.

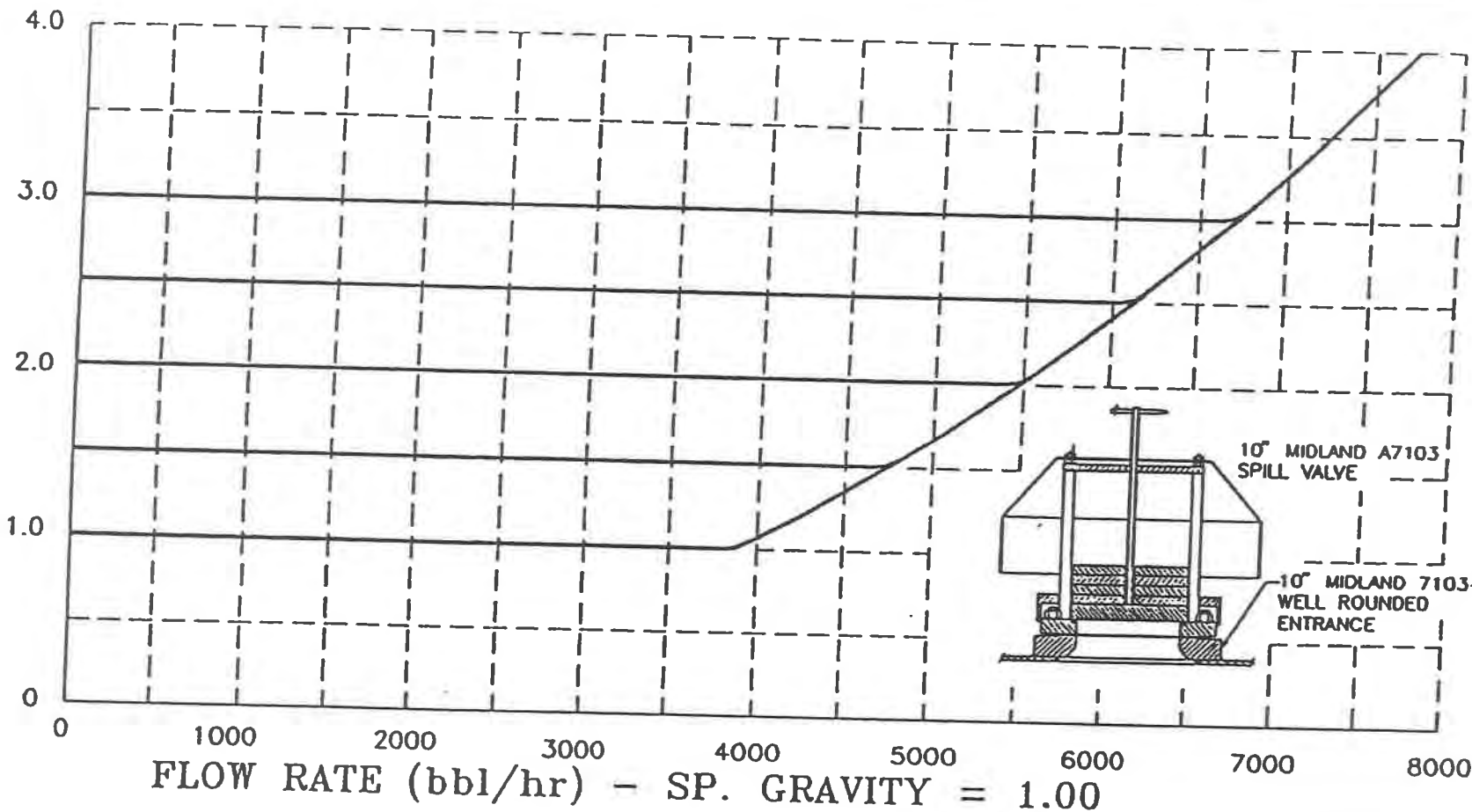
MARINE EQUIPMENT

A-7103

10" SPILL VALVES

C-2-b

PRESSURE AT CARGO TANK TOP (psi)



NOTES:

- 1) THESE CURVES ARE FOR VALVES MOUNTED ON HORIZONTAL FLANGES WITHIN 3" OF TANK TOP ON A WELL ROUNDED ENTRANCE
- 2) THESE CURVES ARE BASED ON 1990 TESTS BY AN INDEPENDENT LABORATORY
- 3) TO DETERMINE PRESSURE, ENTER HORIZONTAL AXIS AT DESIRED FLOW RATE, MOVE UP TO CURVE, TURN AND MOVE TO LEFT VERTICAL AXIS TO READ PRESSURE
- 4) TO DETERMINE FLOW RATE AT A TANK PRESSURE, ENTER VERTICAL AXIS AT DESIRED PRESSURE, MOVE HORIZONTALLY TO CURVE, TURN DOWN TO READ FLOW RATE

CERTIFIED AS COMPLYING WITH
ASTM F1271-90 SPECIFICATION

CAD FILE: 0058

MATERIAL:
ALL 300 SERIES
STAINLESS STEEL

REMOVE ALL BURRS.
BREAK ALL EDGES &
CORNERS

STANDARD TOLERANCES
UNLESS SPECIFIED

DECIMAL: ± 0.005
FRACTIONS: ± 0.015

MIDLAND MFG. CORP.
SKOKIE, IL, U.S.A.

10" SPILL VALVE CAPACITIES
WITH MIDLAND ROUNDED ENTRANCE

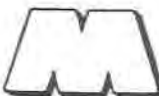
SCALE:

DRAWN BY:

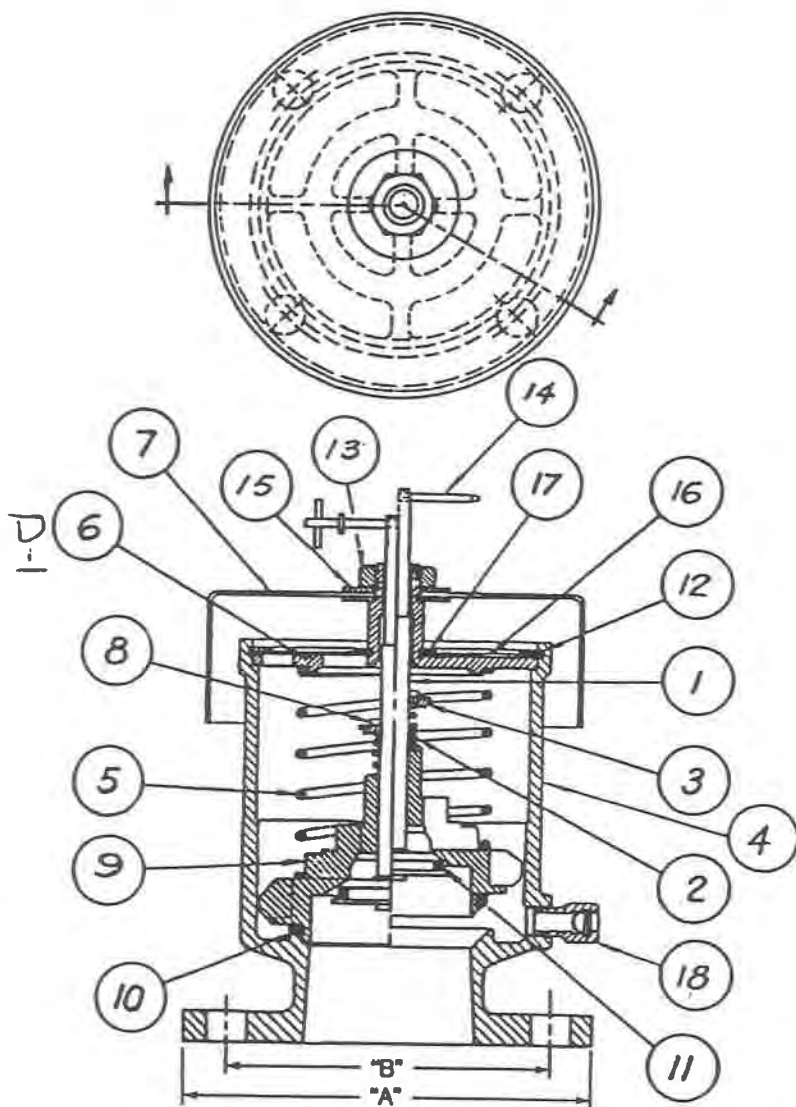
DATE:

REVISION:

A702-9



FLC'D 9/29/92



ITEM NO.	QTY.	PART NAME	MATERIAL	
			BRASS TRIM	STAINLESS TRIM
1	1	POPPET	STAINLESS	STAINLESS
2	1	VACUUM SPRING ⁽²⁾	STAINLESS	STAINLESS
3	1	SPRING SEAT	STAINLESS	STAINLESS
4	1	BODY	BRASS	STAINLESS
5	1	PRESSURE SPRING ⁽²⁾	STAINLESS	STAINLESS
6	1	FOLLOWER	BRASS	STAINLESS
7	1	WEATHER CAP	STAINLESS	STAINLESS
8	1	PIN	STAINLESS	STAINLESS
9	1	VACUUM HOUSING	BRASS	STAINLESS
10	1	PRESSURE SEAL	BUNA N ⁽¹⁾	BUNA N ⁽¹⁾
11	1	VACUUM SEAL	BUNA N ⁽¹⁾	BUNA N ⁽¹⁾
12	1	SPIRAL RETAINING RING	STAINLESS	STAINLESS
13	1	NUT	STAINLESS	STAINLESS
14	1	LIFT PIN	STAINLESS	STAINLESS
15	2	WASHER	STAINLESS	STAINLESS
16	1	FLAME SCREEN ⁽³⁾	STAINLESS	STAINLESS
17	1	SPIRAL RETAINING RING	STAINLESS	STAINLESS
18	1	DRAIN SCREEN ASSEMBLY	STAINLESS	STAINLESS

NOTES: ⁽¹⁾Alternate material available ⁽²⁾Varies according to setting
⁽³⁾30 x 30 x 0.0065 wire mesh

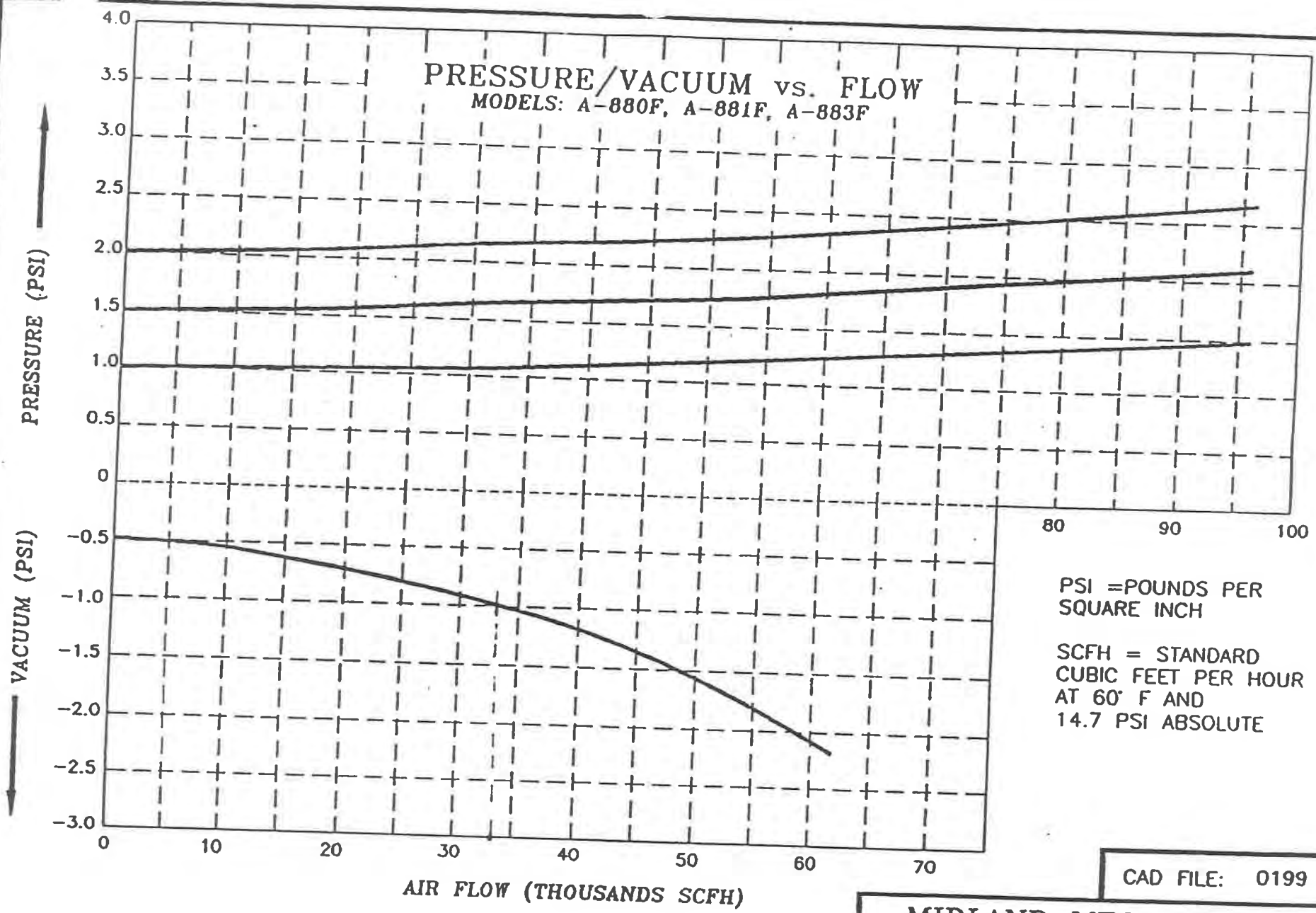
SETTING RANGE (PSI)	
PRESSURE	0.8 to 2.0
VACUUM	0.5 TO 1.0

Specified pressure and vacuum settings desired when ordering.

VALVE MATERIAL	MODEL SUFFIX
BRASS	-BR
STAINLESS	-SS

VALVE SIZE	O.D. FLANGE "A"	BOLT CIRCLE 150# ASA "B"	NUMBER AND SIZE OF BOLT HOLES	VALVE NO.
2-1/2"	7	5-1/2"	(4) 3/4"	A-828-F
3"	7-1/2"	6"	(4) 3/4"	A-833-F
4"	9"	7-1/2"	(8) 3/4"	A-843-F
5"	10"	8-1/2"	(8) 7/8"	A-853-F
6"	11"	9-1/2"	(8) 7/8"	A-863-F
8"	13-1/2"	11-3/4"	(8) 7/8"	A-883-F
10"	16"	14-1/4"	(12) 1"	A-8103-F

D-2



PSI = POUNDS PER SQUARE INCH

SCFH = STANDARD CUBIC FEET PER HOUR AT 60° F AND 14.7 PSI ABSOLUTE

- NOTES:
- 1) THIS DATA IS FROM ACTUAL TESTS OF APRIL 1992 BY AN INDEPENDENT LABORATORY
 - 2) FLOW TESTING WAS PERFORMED IN ACCORDANCE WITH API 2000 WITH PRESSURES MEASURED AT THE VALVE INLET

CAD FILE: 0199	
MIDLAND MFG. CORP. SKOKIE, IL, U.S.A.	
8" PRESSURE-VACUUM VALVE CAPACITIES PRESSURE/VACUUM vs. FLOW	
SCALE:	DRAWN BY: Maggio
DATE: 11/23/92	REVISION:

A800-19

13. USCG VAP COLLECT'N SYS. CARGO CATEGORIES
 1. NO ADD'L VCS REQMTS ABOVE THOSE FOR BENZENE, GASOLINE & CRUDE OIL
 2. POLYMERIZES
 3. HGHLY TOXIC
 4. POLYMERIZES & HGHLY TOXIC
 5. HIGH VAPOR GROWTH RATE
 6. HIGH VAP GROWTH RATE & HGHLY TOXIC
 7. HIGH VAP GROWTH RATE & POLYMERIZES
 8. MORE INFO NEEDED BEFORE REQMTS CAN BE DETERMINED
14. VGR = 1.25 FOR GASOLINE, CRUDE OIL, AND BENZENE.
15. NF/NC = NON-FLAMMABLE/NON-COMBUSTIBLE

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE II: VAPOR-AIR MIX DENSITY,
SPECIFIC GRAVITY, & VAPOR GROWTH RATE

CARGO	C H I S	LIQUID SPECIF. GRAVITY	USCG VAP COL. SYST CAT.	MOLEC'R WEIGHT OF CARGO MWc	SPECIF GRAV OF CARGO VAPOR SGv	SATUR'D VAPOR PRESS @ 115 F Pv, 115 (3) (15) (PSIA)	TOTAL VAP-AIR PRESS @ 115 F Pt, 115 (4) (PSIA)	PARTIAL VOLUME OF VAP @ 115 F Vv, 115 (5)	PARTIAL VOLUME OF AIR @ 115 F Va, 115 (6)	AIR WEIGHT @ 115 F Wa, 115 (7) (LBm/ FT^3)	VAPOR- AIR MIX WEIGHT @ 115 F Wv-a, 115 (8) (LBm/ FT^3)	VAPOR- AIR MIX SPECIFIC GRAVITY Wv-a, 115/ Wa, 115	VAPOR- AIR MIX GROWTH RATE VGR (9)
46 CFR SUBCHAPT O, TABLE 151													
ACETIC ACID	AAC	1.05	1	60.052	2.07	0.92	16.200	0.057	0.943	0.076	0.081	1.061	1.018
ACETIC ANHYDRIDE	ACA	1.08	1	102.050	3.50	0.40	16.200	0.025	0.975	0.076	0.081	1.062	1.008
ACETONITRILE	ATN	0.78	3	41.053	1.41	0.03	16.200	0.002	0.998	0.076	0.076	1.001	1.001
ACRYLIC ACID	ACR	1.05	2	72.064	2.48	0.40	16.200	0.025	0.975	0.076	0.079	1.037	1.008
ACRYLONITRILE	ACN	0.81	4	53.064	1.80	5.00	16.200	0.309	0.691	0.076	0.095	1.247	1.100
ADIPONITRILE	ADN	0.95	1	108.000	3.73	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
ALUMINUM SULFATE SOLUTION	ASX	1.76											
AMINOETHYLETHANOLAMINE	AEE	1.03	1	104.150	3.59	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
AMMONIUM BISULFITE SOLN (70% OR LESS)	ABX	1.44	1			NF/NC							
AMMONIUM HYDROXIDE (28% OR LESS NH3)	AMH		3	35.050	1.21	NF/NC							
ANTHRACENE OIL (COAL TAR FRACTION)	AHO												
BENZENE	BNZ	0.88	1	78.114	2.80	4.50	16.200	0.278	0.722	0.076	0.114	1.500	1.250
BENZENE HYDROCARBON MIXTURES (W/ACETYLENES) (W/10% BENZENE OR MORE)	BHA	0.84	1		2.80	7.30	16.200	0.451	0.549	0.076	0.138	1.811	1.146
BENZENE HYDROCARBON MIXTURES (W/10% BENZENE OR MORE)	BHB	0.84	1		2.80	7.30	16.200	0.451	0.549	0.076	0.138	1.811	1.146
BENZENE, TOLUENE, XYLENE MIXTURES (HAVING 10% BENZENE OR MORE)	BTX	0.84	1	106.080	2.80	7.30	16.200	0.451	0.549	0.076	0.138	1.811	1.146
iso-BUTYL ACRYLATE	BAI	0.88	2	128.170	4.42	0.60	16.200	0.037	0.963	0.076	0.086	1.127	1.012
n-BUTYL ACRYLATE	BTC	0.90	2	128.170	4.40	0.40	16.200	0.025	0.975	0.076	0.083	1.084	1.008
BUTYL ACRYLATE (SEE ISO- & N- BUTYL ACRYLATE)	BAR	0.90	2		4.42	0.60	16.200	0.037	0.963	0.076	0.086	1.127	1.012
BUTYL METHACRYLATE	BMH	0.88	2	142.200	4.90	0.29	16.200	0.018	0.982	0.076	0.081	1.070	1.006
iso-BUTYRALDEHYDE	BAD	0.80	1	72.107	2.50	7.80	16.200	0.481	0.519	0.076	0.131	1.722	1.156
n-BUTYRALDEHYDE	BTR	0.80	1	72.107	2.50	7.80	16.200	0.481	0.519	0.076	0.131	1.722	1.156
BUTYRALDEHYDES (CRUDE)	BFA	0.82	1	72.060	2.48	8.00	16.200	0.494	0.506	0.076	0.132	1.731	1.160
BUTYRALDEHYDE (ISO-, N-)	BAE	0.82	1		2.48	8.00	16.200	0.494	0.506	0.076	0.132	1.731	1.160
CAMPHOR OIL (LIGHT)	CPO	0.92	8										
CARBON TETRACHLORIDE	CBT	1.59	3	153.820	5.31	NF/NC							
CAUSTIC POTASH SOLUTION	CPS	1.50	1			NF/NC							
CAUSTIC SODA SOLUTION	CSS	1.50	1			NF/NC							
CHLOROBENZENE	CRB	1.11	1	112.559	3.88	0.80	16.200	0.049	0.951	0.076	0.087	1.142	1.016
CHLOROFORM	CRF	1.48	3	119.380	4.12	NF/NC							
CHLOROSULFONIC ACID	CSA	1.79											
COAL TAR NAPHTHA SOLVENT	NCT	0.88	1		3.66	0.20	16.200	0.012	0.988	0.076	0.079	1.033	1.004
CREOSOTE (COAL TAR)	CCT	1.07	1		3.72	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
CREOSOTE (WOOD)	CWD	1.07	1		3.72	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
CRESOLS (ALL ISOMERS)	CRS	1.05	1	108.130	3.72	0.06	16.200	0.004	0.996	0.076	0.077	1.010	1.001
CRESOLS WITH LESS THAN 5% PHENOL (SEE CRESOLS (ALL ISOMERS))	CRS	1.05	1										
CRESOLS WITH 5% OR MORE PHENOL (SEE PHENOL)	CFP	1.07	3		3.72	0.05	16.200	0.003	0.997	0.076	0.077	1.008	1.001
CRESYLATE SPENT CAUSTIC	CSC	1.55	1			NF/NC							
CRESYLIC ACID, SODIUM SALT SOLUTION, SEE CRESYLATE SPENT CAUSTIC	CAX (TAR ?)		1										
CROTONALDEHYDE	CTA	0.85	4	70.050	2.41	2.00	16.200	0.123	0.877	0.076	0.089	1.174	1.040

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE II: VAPOR-AIR MIX DENSITY,
SPECIFIC GRAVITY, & VAPOR GROWTH RATE

CARGO	C H R I S	LIQUID SPECIF. GRAVITY (1)	USCG VAP COL. SYST CAT. (13)	MOLEC'R WEIGHT OF CARGO MWc (1)	SPECIF GRAV OF CARGO VAPOR SGv (2)	SATUR'D VAPOR PRESS @ 115 F Pv,115 (3) (15) (PSIA)	TOTAL VAP-AIR PRESS @ 115 F Pt,115 (4) (PSIA)	PARTIAL VOLUME OF VAP @ 115 F Vv,115 (5)	PARTIAL VOLUME OF AIR @ 115 F Va,115 (6)	AIR WEIGHT DENSITY @ 115 F Wa,115 (7) (LBm/ FT^3)	VAPOR- AIR MIX WEIGHT DENSITY @ 115 F Wv-a,115 (8) (LBm/ FT^3)	VAPOR- AIR MIX SPECIFIC GRAVITY Wv-a,115/ Wa,115	VAPOR- AIR MIX GROWTH RATE VGR (9)
CYCLOHEXANONE	CCH	0.95	1	98.145	3.40	0.02	16.200	0.001	0.999	0.076	0.076	1.003	1.000
CYCLOHEXYLAMINE	CHA	0.87	1		3.42	0.62	16.200	0.038	0.962	0.076	0.083	1.093	1.012
DECYL ACRYLATE (iso-, n-)	DAT	0.89	2	212.330	7.30	0.01	16.200	0.001	0.999	0.076	0.076	1.004	1.000
DICHLOROBENZENE (ALL ISOMERS)	DBX	1.30	3		5.07	0.10	16.200	0.006	0.994	0.076	0.078	1.025	1.002
1,1-DICHLOROETHANE	DCH	1.18	1	98.960	3.41	9.90	16.200	0.611	0.389	0.076	0.188	2.473	1.198
2,2-DICHLOROETHYL ETHER	DEE	1.22	1	143.000	4.90	0.04	16.200	0.002	0.998	0.076	0.077	1.010	1.001
DICHLOROMETHANE (ALSO KNOWN AS METHYLENE CHLORIDE)	DCM	1.32	5	84.940	2.93	NF/NC							
2,4-DICHLOROPHENOXYACETIC ACID DIETHANOLAMINE SALT SOLUTION	DDE												
2,4-DICHLOROPHENOXYACETIC ACID, DIMETHYLAMINE SALT SOLUTION	DAD		1										
2,4-DICHLOROPHENOXYACETIC ACID, TRIISOPROPANOLAMINE SALT SOLUTION	NDTI												
1,1-,1,2- OR 1,3- DICHLOROPROPANE	DPX	1.16	3	112.960	3.90	6.30	16.200	0.389	0.611	0.076	0.162	2.128	1.126
1,3-DICHLOROPROPENE	DFU	1.23	4	110.980	3.84	5.50	16.200	0.340	0.660	0.076	0.150	1.964	1.110
DICHLOROPROPENE, DICHLOROPROPANE MIXTURES	DMX	1.21	1		3.90	6.30	16.200	0.389	0.611	0.076	0.162	2.128	1.126
2,2-DICHLOROPROPIONIC ACID	DCN												
DIETHANOLAMINE	DEA	1.09	1	105.140	3.65	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
DIETHYLAMINE	DEN	0.71	3	73.139	2.50	1.00	16.200	0.062	0.938	0.076	0.083	1.093	1.020
DIETHYLENETRIAMINE	DET	0.96	1	103.170	3.48	0.04	16.200	0.002	0.998	0.076	0.077	1.006	1.001
DIETHYL ETHER, SEE ETHYL ETHER	DEH			74.123	2.56								
DIISOBUTYLAMINE	DBU	0.75	3	129.247	4.46	0.46	16.200	0.028	0.972	0.076	0.084	1.098	1.009
DIISOPROPANOLAMINE	DIP	0.98	1	133.190	4.59	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
DIISOPROPYLAMINE	DIA	0.72	3	101.193	3.50	3.70	16.200	0.228	0.772	0.076	0.120	1.571	1.074
N,N-DIMETHYLACETAMIDE	DAC	0.95	3		3.00	0.20	16.200	0.012	0.988	0.076	0.078	1.025	1.004
DIMETHYLETHANOLAMINE	DMB	0.89	1		3.03	0.50	16.200	0.031	0.969	0.076	0.081	1.063	1.010
DIMETHYLFORMAMIDE	DMF	0.95	1	73.090	2.51	0.30	16.200	0.019	0.981	0.076	0.078	1.028	1.006
1,4-DIOXANE	DOX	1.04	1		3.03	1.84	16.200	0.114	0.886	0.076	0.094	1.231	1.037
DI-N-PROPYLAMINE	DNA	0.74	3	58.080	3.50	1.50	16.200	0.093	0.907	0.076	0.094	1.232	1.030
ETHANOLAMINE	MEA	1.02	1	61.080	2.10	0.03	16.200	0.002	0.998	0.076	0.076	1.002	1.001
ETHYL ACRYLATE	EAC	0.93	2	100.118	3.50	2.00	16.200	0.123	0.877	0.076	0.100	1.309	1.040
ETHYLAMINE SOLUTION (72% OR LESS)	EAN	0.80	6	45.060	1.56	15.50	16.200	0.957	0.043	0.076	0.117	1.536	1.310
N-ETHYLBUTYLAMINE	EBA	0.74	3	101.190	3.50	1.20	16.200	0.074	0.926	0.076	0.090	1.185	1.024
N-ETHYLCYCLOHEXYLAMINE	ECC	0.86	1	127.140	4.40	0.50	16.200	0.031	0.969	0.076	0.084	1.105	1.010
ETHYLENE CYANOHYDRIN	ETC	1.04	1	71.080	2.45	0.01	16.200	0.001	0.999	0.076	0.076	1.001	1.000
ETHYLENEDIAMINE	EDA	0.91	1	60.099	2.10	0.90	16.200	0.056	0.944	0.076	0.081	1.061	1.018
ETHYLENE DIBROMIDE	EDB	2.17				NF/NC							
ETHYLENE DICHLORIDE	EDC	1.26	1	98.960	3.42	4.00	16.200	0.247	0.753	0.076	0.122	1.598	1.080
ETHYLENE GLYCOL PROPYL ETHER	EGP	0.91	1		4.80	0.60	16.200	0.037	0.963	0.076	0.087	1.141	1.012
2-ETHYLHEXYL ACRYLATE	EAI	0.89	2	184.200	6.35	0.02	16.200	0.001	0.999	0.076	0.077	1.007	1.000
ETHYLIDENE NORBORNENE	ENB	0.90	3		4.10	0.33	16.200	0.020	0.980	0.076	0.081	1.063	1.007
ETHYL METHACRYLATE	ETM	0.92	2		3.94	1.00	16.200	0.062	0.938	0.076	0.090	1.182	1.020
2-ETHYL-3-PROPYLACROLEIN	EPA	0.85	1	126.190	4.35	0.12	16.200	0.007	0.993	0.076	0.078	1.025	1.002
FERRIC CHLORIDE SOLUTIONS	FCS												
FORMALDEHYDE SOLUTION (37% TO 50%)	FMS	1.13	1		1.03	0.15	16.200	0.009	0.991	0.076	0.076	1.000	1.003

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE II: VAPOR-AIR MIX DENSITY,
SPECIFIC GRAVITY, & VAPOR GROWTH RATE

CARGO	C H I S	LIQUID SPECIF. GRAVITY	USCG VAP COL. SYST CAT.	MOLEC'R WEIGHT OF CARGO MWc	SPECIF GRAV OF CARGO VAPOR SGv	SATUR'D VAPOR PRESS @ 115 F Pv, 115 (3) (15) (PSIA)	TOTAL VAP-AIR PRESS @ 115 F Pt, 115 (4) (PSIA)	PARTIAL VOLUME OF VAP @ 115 F Vv, 115 (5)	PARTIAL VOLUME OF AIR @ 115 F Va, 115 (6)	AIR WEIGHT DENSITY @ 115 F Wa, 115 (7) (LBm/ FT ³)	VAPOR- AIR MIX WEIGHT DENSITY @ 115 F Wv-a, 115 (8) (LBm/ FT ³)	VAPOR- AIR MIX SPECIFIC GRAVITY Wv-a, 115/ Wa, 115	VAPOR- AIR MIX GROWTH RATE VGR (9)
FORMIC ACID	FMA	1.22	1		1.60	2.10	16.200	0.130	0.870	0.076	0.082	1.078	1.042
FURFURAL	FFA	1.20	1	96.085	3.31	0.15	16.200	0.009	0.991	0.076	0.078	1.021	1.003
GLUTARALDEHYDE SOLUTION (50% OR LESS)	GTA		1			NF/NC							
HEXAMETHYLENEDIAMINE SOLUTION	HMC	0.93	1	116.140	4.00	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
HEXAMETHYLENEIMINE	HMI	0.88	1		1.00	0.50	16.200	0.031	0.969	0.076	0.076	1.000	1.010
HYDROCHLORIC ACID SPENT (15% OR LESS)	HCS	1.21											
ISOPENTALDEHYDE (MIXED ISOMERS) (SEE VALERALDEHYDE (ISO-, N-))													
ISOPRENE	IPR	0.69	7	68.120	2.35	23.00	16.200	1.420	-0.420	0.076	0.222	2.917	1.460
KRAFT PULPING LIQUORS (FREE ALKALI CONTENT 3% OR MORE) (INCLUDING: KPL)	MSO	0.86	1		3.50	0.67	16.200	0.041	0.959	0.076	0.084	1.103	1.013
MESITYL OXIDE	MAM	0.95	2	86.091	3.00	4.10	16.200	0.253	0.747	0.076	0.115	1.506	1.082
METHYL ACRYLATE	MCK	0.94	1		0.93	0.15	16.200	0.009	0.991	0.076	0.076	0.999	1.003
METHYLCYCLOPENTADIENE DIMER	MDE	1.04	1		4.10	0.10	16.200	0.006	0.994	0.076	0.078	1.019	1.002
METHYL DIETHANOLAMINE	MEP	0.92	1	121.000	4.18	0.16	16.200	0.010	0.990	0.076	0.079	1.031	1.003
2-METHYL-5-ETHYLPYRIDINE	MMM	0.94	2	100.110	3.45	2.02	16.200	0.125	0.875	0.076	0.099	1.306	1.040
METHYLENE CHLORIDE (SEE DICHLOROMETHANE)	MPR	0.95	3	93.129	3.20	0.50	16.200	0.031	0.969	0.076	0.081	1.068	1.010
METHYL METHACRYLATE	MSR	0.89	2	118.179	4.08	0.40	16.200	0.025	0.975	0.076	0.082	1.076	1.008
2-METHYLPYRIDINE	MPL	1.00	1	87.122	3.00	0.80	16.200	0.049	0.951	0.076	0.084	1.099	1.016
alpha-METHYLSTYRENE	NCD												
MORPHOLINE	NPM	0.99	1	89.090	3.06	1.05	16.200	0.065	0.935	0.076	0.086	1.134	1.021
NITRIC ACID (70% OR LESS)	ONE	1.00	1		6.00	0.31	16.200	0.019	0.981	0.076	0.083	1.096	1.006
NITROPROPANE (-1, OR -2)	OLM	1.98			2.76	0.01	16.200	0.001	0.999	0.076	0.076	1.001	1.000
OCTYL NITRATES (ALL ISOMERS)	PCE	1.67				NF/NC							
OLEUM	PDE	0.68	7	68.060	2.36	17.06	16.200	1.053	-0.053	0.076	0.185	2.432	1.341
PENTACHLOROETHANE	PER	1.62	1	165.820	5.72	NF/NC							
1, 3-PENTADIENE	PAC	1.83											
PERCHLOROETHYLENE (SAME AS TETRACHLOROETHYLENE)	PEB	0.99	1		5.00	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
PHOSPHORIC ACID	PPI	1.20	1		13.79	0.00							
POLYETHYLENE POLYAMINES	MPA	0.96	1	76.000	2.59	0.08	16.200	0.005	0.995	0.076	0.077	1.008	1.002
POLYMETHYLENE POLYPHENYL ISOCYANATE	PAX	0.96	1		2.59	0.08	16.200	0.005	0.995	0.076	0.077	1.008	1.002
POTASSIUM HYDROXIDE SOLUTION (SEE CAUSTIC POTASH SOLUTION)	PNA	1.00	1	74.080	2.56	0.30	16.200	0.019	0.981	0.076	0.078	1.029	1.006
iso-PROPANOLAMINE	IPP	0.69	5	59.112	2.04	23.42	16.200	1.446	-0.446	0.076	0.191	2.504	1.468
PROPIONIC ACID	IPE	0.72	1		3.50	6.64	16.200	0.410	0.590	0.076	0.154	2.025	1.133
iso-PROPYLAMINE	PRD	0.98	1	79.102	2.72	1.30	16.200	0.080	0.920	0.076	0.087	1.138	1.026
iso-PROPYL ETHER	SAU												
PYRIDINE	SDD	1.63	1			NF/NC							
SODIUM ALUMINATE SOLUTION	SDL					NF/NC							
SODIUM CHLORATE SOLUTION (50% OR LESS)													
SODIUM DICHROMATE SOL'N (70% OR LESS)													
SODIUM HYDROXIDE SOLUTION (SEE CAUSTIC SODA SOLUTION)													
SODIUM HYPOCHLORITE SOL'N (15% OR LESS)	SHP	1.10				NF/NC							
SODIUM SULFIDE, HYDROSULFIDE SOLUTIONS (H2S 15 PPM OR LESS)	SSH	1.32											

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

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SPECIFIC GRAVITY, & VAPOR GROWTH RATE

CARGO	C H R I S	LIQUID SPECIF. GRAVITY	USCG VAP COL. SYST CAT.	MOLEC'R WEIGHT OF CARGO MWc	SPECIF GRAV OF CARGO VAPOR SGv	SATUR'D VAPOR PRESS @ 115 F Pv,115 (3) (15) (PSIA)	TOTAL VAP-AIR PRESS @ 115 F Pt,115 (4) (PSIA)	PARTIAL VOLUME OF VAP @ 115 F Vv,115 (5)	PARTIAL VOLUME OF AIR @ 115 F Va,115 (6)	AIR WEIGHT DENSITY @ 115 F Wa,115 (7) (LBm/ FT^3)	VAPOR- AIR MIX WEIGHT DENSITY @ 115 F Wv-a,115 (8) (LBm/ FT^3)	VAPOR- AIR MIX SPECIFIC GRAVITY Wa,115	VAPOR- AIR MIX GROWTH RATE VGR (9)
SODIUM SULFIDE HYDROSULFIDE SOLUTIONS (15 PPM<H2S<200 PPM)	SSI	1.32											
SODIUM SULFIDE HYDROSULFIDE SOLUTIONS (H2S GREATER THAN 200 PPM)	SSJ	1.32											
SODIUM THIOCYANATE SOLUTION (56% OR LESS)	STS					NF/NC							
STYRENE MONOMER	STY	0.92		104.150	3.60	0.40	16.200	0.025	0.975	0.076	0.081	1.064	1.008
SULFURIC ACID	SFA	1.84			3.40	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
SULFURIC ACID, SPENT	SAC	1.39				0.01	16.200	0.001	0.999	0.076	0.076	0.999	1.000
1,1,2,2-TETRACHLOROETHANE (ACETYLENE TETRACHLORIDE)	TEC	1.59		147.410	5.09								
TETRAETHYLENEPENTAMINE	TTP	1.00	1		6.80	0.00	16.200	0.000	1.000	0.076	0.076	1.000	1.000
TETRAHYDROFURAN	THF	0.89	1	72.107	1.35	8.50	16.200	0.525	0.475	0.076	0.090	1.184	1.170
1,1,2-TRICHLOROETHANE (VINYL TRICHLORIDE)	TCM	1.44	1	133.390	4.60	1.02	16.200	0.063	0.937	0.076	0.093	1.227	1.020
TRICHLOROETHANE (SEE 1,1,2-TRICHLOROETHANE)													
TRICHLOROETHYLENE	TCL	1.46	1	131.380	4.50	3.46	16.200	0.214	0.786	0.076	0.133	1.748	1.069
1,2,3-TRICHLOROPROPANE	TCN	1.39	3	147.432	5.60	0.15	16.200	0.009	0.991	0.076	0.079	1.043	1.003
TRIETHANOLAMINE	TEA	1.13	1	149.190	5.14	0.01	16.200	0.001	0.999	0.076	0.076	1.003	1.000
TRIETHYLAMINE	TEN	0.73	3	101.193	3.49	2.50	16.200	0.154	0.846	0.076	0.105	1.384	1.050
TRIETHYLENETETRAMINE	TET	0.98	1	146.240	5.04	0.01	16.200	0.001	0.999	0.076	0.076	1.003	1.000
UREA, AMMONIUM NITRATE SOL'N (CONTAINING MORE THAN 2% NH3)	UAS		1			NF/NC							
VALERALDEHYDE (iso-, n-)		0.79	1	86.134	3.00	5.00	16.200	0.309	0.691	0.076	0.123	1.617	1.100
VALERALDEHYDE (iso-)	IVA	0.79	1		3.00	5.00	16.200	0.309	0.691	0.076	0.123	1.617	1.100
VALERALDEHYDE (n-)	VAL	0.84	1		5.93	0.01	16.200	0.001	0.999	0.076	0.076	1.003	1.000
VANILLAN BLACK LIQUOR (FREE ALKALI CONTENT 3% OR MORE)	VBL		1										
VINYL ACETATE	VAM	0.94	2	86.091	2.97	5.80	16.200	0.358	0.642	0.076	0.130	1.705	1.116
VINYLTOLUENE	VNT	0.90	2		4.08	0.12	16.200	0.007	0.993	0.076	0.078	1.023	1.002

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CARGO	C H R I S	LIQUID SPECIF. GRAVITY	USCG VAP COL.	MOLEC'R WEIGHT OF CARGO	SPECIF GRAV OF CARGO	SATUR'D VAPOR PRESS @ 115 F Pv, 115 (15) (PSIA)	TOTAL VAP-AIR PRESS @ 115 F Pt, 115 (4) (PSIA)	PARTIAL VOLUME OF VAP @ 115 F Vv, 115 (5)	PARTIAL VOLUME OF AIR @ 115 F Va, 115 (6)	AIR WEIGHT DENSITY @ 115 F Wa, 115 (7) (LBm/ FT^3)	VAPOR- AIR MIX WEIGHT DENSITY @ 115 F Wv-a, 115 (8) (LBm/ FT^3)	VAPOR- AIR MIX SPECIFIC GRAVITY Wv-a, 115/ Wa, 115	VAPOR- AIR MIX GROWTH RATE VGR (9)
1,1-DICHLOROPROPANE	DPB	1.16	3		3.90	6.30	16.200	0.389	0.611	0.076	0.162	2.128	1.126
1,1,1-TRICHLOROETHANE		1.51	1	133.390	4.60	NF/NC							
1,2-DICHLOROPROPANE	DPP	1.16	3		3.50	2.60	16.200	0.160	0.840	0.076	0.107	1.401	1.052
1,3-CYCLOPENTADIENE			1										
1,3-DICHLOROPROPANE	DPC	1.16	3		3.90	3.80	16.200	0.235	0.765	0.076	0.128	1.680	1.076
2-METHYL-2-HYDROXY-3-BUTYNE	MHB	0.86	1		2.90	1.14	16.200	0.070	0.930	0.076	0.086	1.134	1.023
2,4-DICHLOROPHENOXYACETIC ACID, DIMETHYLAMINE SALT SOLUTION (70%)	DDA												
3-PENTENENITRILE	PNT (CRUDE ?)		8										
AEROTHENE TT (1,1,1-TRICHLOROETHANE)			8	133.390	4.60								
ALKYLBENZENE			1										
AMINOETHYLPYPERAZINE	AEP		1										
BENZENE RAFFINATE (ASSUME VAPOR PROPERTIES SIMILAR TO BENZENE)		0.70				4.50	16.200	0.278	0.722	0.076	0.114	1.500	1.250
BENZENE SULFONYL CHLORIDE	BSC	1.38	1		6.09	0.00	16.200	0.000	1.000	0.076	0.076	1.000	1.000
BENZYL ACETATE	BZE	1.04	1		5.18	0.02	16.200	0.001	0.999	0.076	0.077	1.005	1.000
BENZYL CHLORIDE (STABILIZED)	BCL	1.10	4		4.36	0.09	16.200	0.006	0.994	0.076	0.078	1.019	1.002
BUTANOL			1										
BUTYL ETHER (n-)	BTE	0.77	3		4.50	0.40	16.200	0.025	0.975	0.076	0.083	1.086	1.008
BUTYLENE OXIDE (1,2-)	BTO	0.83	2		2.49	9.18	16.200	0.567	0.433	0.076	0.140	1.844	1.184
BUTYRIC ACID	BRA	0.96	1		3.00	0.07	16.200	0.004	0.996	0.076	0.077	1.009	1.001
CARBOLIC ACID	CBO	1.04	3		3.25	0.06	16.200	0.004	0.996	0.076	0.077	1.008	1.001
CHLOROACETIC ACID (80% OR LESS)	CHM	1.58			3.26	0.01	16.200	0.001	0.999	0.076	0.076	1.001	1.000
CHLOROPROPIONIC ACID (2- OR 3-)	CPM	1.26	1		3.70	0.02	16.200	0.001	0.999	0.076	0.076	1.003	1.000
CHLOROTOLUENE (m-)	CTM	1.07	1		4.40	0.32	16.200	0.020	0.980	0.076	0.081	1.067	1.006
CHLOROTOLUENE (o-)	CTO	1.08	1		4.40	0.32	16.200	0.020	0.980	0.076	0.081	1.067	1.006
CHLOROTOLUENE (p)	CRN	1.07	1		4.36	0.09	16.200	0.006	0.994	0.076	0.078	1.019	1.002
CHLOROTOLUENES (MIXED ISOMERS)	CHI	1.08	1		4.40	0.53	16.200	0.033	0.967	0.076	0.085	1.111	1.011
CREOSOTE (ALL ISOMERS)	CCW	1.07	1		3.72	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
CRESYLIC ACID TAR	CRX	1.05	1		1.00	0.10	16.200	0.006	0.994	0.076	0.076	1.000	1.002
CYCLOHEPTANE	CYE	0.81	1		3.39	1.40	16.200	0.086	0.914	0.076	0.092	1.207	1.028
CYCLOHEXANONE, CYCLOHEXANOL MIXTURE	CYX	0.95	1		3.38	1.00	16.200	0.062	0.938	0.076	0.087	1.147	1.020
CYCLOHEXYL ACETATE	CYC	0.97	1		4.90	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
CYCLOPENTADIENE, STYRENE, BENZENE MIXTURE	CSB	1.50	1		4.55	4.50	16.200	0.278	0.722	0.076	0.151	1.986	1.090
CYCLOPENTANE	CYP	0.74	1		2.40	13.15	16.200	0.812	0.188	0.076	0.163	2.136	1.263
DECANOIC ACID	DCO	5.94	1		5.93	0.00							
DI 2 ETHYLHEXYL PHTHALATE (SEE ALSO ETHYLHEXYL PHTHALATE)		0.98											
DICHLOROISOPROPYL ETHER (2,2'-)	DCI	1.11	1		5.90	0.06	16.200	0.004	0.996	0.076	0.078	1.018	1.001
DICHLOROPROPANE		1.16											
DICHLOROPROPENE		1.23											
DIETHYL SULFATE	DSU	1.18	1		5.30	0.01	16.200	0.001	0.999	0.076	0.076	1.003	1.000

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DIETHYLETHANOLAMINE	DAE	0.89	1		4.03	0.18	16.200	0.011	0.989	0.076	0.079	1.034	1.004
DODECYL BENZENE			1										
DODECYLDIMETHYLAMINE TETRADECYLDIMETHYLAMINE MIXTURE	DOT												
DRIPOLENE			1										
ETHANOL (see ethyl alcohol)			1	46.069	1.59								
ETHYL BROMIDE			8	108.966	3.76								
ETHYL TERT-BUTYL ETHER	EBE	0.73	1		3.50	5.00	16.200	0.309	0.691	0.076	0.135	1.772	1.100
ETHYLAMINE	EAM	0.80	6	45.085	1.55	40.80	16.200	2.519	-1.519	0.076	0.182	2.385	1.816
ETHYLENE DICHLORIDE 1,1,2-TRICHLOROETHANE MIXTURE	ETX	1.44	1		4.60	3.70	16.200	0.228	0.772	0.076	0.139	1.822	1.074
ETHYLMERCAPTAN (SAME AS ETHANETHIOL)			6										
ETHYLPHENOL	EPL	1.04	1		4.21	0.02	16.200	0.001	0.999	0.076	0.076	1.004	1.000
FORMALDEHYDE SOLUTION (50% OR MORE), METHANOL MIXTURES	MTM	0.79	1		1.10	6.63	16.200	0.409	0.591	0.076	0.079	1.041	1.133
HYDROSULFIDE			8										
INDENES			8										
ISOBUTYL ACETATE	IBA			116.160	4.01	0.36	16.200	0.022	0.978	0.076	0.081	1.068	1.007
ISOPRENE, PENTADIENE MIXTURE	IPN												
ISO-PROPYL ALCOHOL		0.79	1	60.096	2.07	3.00	16.200	0.185	0.815	0.076	0.091	1.199	1.060
LAURIC ACID	LRA	0.88	1	6.910	0.00								
METHACRYLONITRILE	MET	0.80	2		2.31	3.39	16.200	0.209	0.791	0.076	0.097	1.274	1.068
METHANOL		0.79	1	32.042	1.11								
METHYL STYRENE			2										
METHYL STYRENE, INDENES, ALKYL BENZENE MIXTURES	MIA												
METHYLCYCLOHEXANE	MCY	0.77	1		3.40	2.37	16.200	0.146	0.854	0.076	0.103	1.351	1.047
METHYLHEXANE (SAME AS HEPTANE)			1										
MONOETHANOLAMINE	MEA	1.02		61.084	2.11	0.10	16.200	0.006	0.994	0.076	0.077	1.007	1.002
MONOISOPROPANOLAMINE		0.96		75.110	2.59	0.20	16.200	0.012	0.988	0.076	0.078	1.020	1.004
NAPHTHALENE (MOLTEN)	NTM	1.15	1		4.41	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
NEODECANOIC ACID	NEA	0.92	1		6.00	0.01	16.200	0.001	0.999	0.076	0.076	1.003	1.000
NITRILOTRIACETIC ACID	NAA (&SALTS ?		8			NF/NC							
NITROPHENOL (MOLTEN)	NTP	1.49	1		4.79	0.00							
NITROPROPANE (60%), NITROETHANE (40%) MIXTURE	NNM	1.05	1		3.06	1.10	16.200	0.068	0.932	0.076	0.087	1.140	1.022
NITROTOLUENE (o-,p-)	NIT	1.16	1		4.72	0.02	16.200	0.001	0.999	0.076	0.076	1.005	1.000
PARALDEHYDE	PDH	0.99	1		4.55	8.30	16.200	0.512	0.488	0.076	0.215	2.819	1.166
POLYGLYCERINE, SODIUM SALT SOLN (CONTAINING 3% OR MORE SODIUM HYDROXIDE)	PAD	0.81	2		2.00	13.76	16.200	0.849	0.151	0.076	0.141	1.849	1.275
PROPIONALDEHYDE	PAH	1.01	1		4.50	0.11	16.200	0.007	0.993	0.076	0.078	1.024	1.002
PROPIONIC ANHYDRIDE	PCN	0.70	1		1.90	1.17	16.200	0.072	0.928	0.076	0.081	1.065	1.023
PROPIONITRILE	PRA	0.72	1		2.04	13.55	16.200	0.836	0.164	0.076	0.142	1.870	1.271
PROPYLAMINE (n-)			1		0.20	4.14	16.200	0.256	0.744	0.076	0.061	0.796	1.083
PROPYLBENZENE													
PYROLYSIS GASOLINE (GREATER THAN 5% BENZENE)	GPY	0.84	1		2.80	7.30	16.200	0.451	0.549	0.076	0.138	1.811	1.146
PYROLYSIS RESIDUAL FUELS		0.89											
SEWAGE, RAW	SWR												

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE II: VAPOR-AIR MIX DENSITY,
SPECIFIC GRAVITY, & VAPOR GROWTH RATE

C H R I S	LIQUID SPECIF. GRAVITY	USCG VAP COL.	MOLEC'R WEIGHT OF CARGO MWC	SPECIF GRAV OF CARGO VAPOR SGV	SATUR'D VAPOR PRESS @ 115 F Pv, 115 (15) (PSIA)	TOTAL VAP-AIR PRESS @ 115 F Pt, 115 (4) (PSIA)	PARTIAL VOLUME OF VAP @ 115 F Vv, 115 (5)	PARTIAL VOLUME OF AIR @ 115 F Va, 115 (6)	AIR WEIGHT DENSITY @ 115 F Wa, 115 (7) (LBm/ FT^3)	VAPOR- AIR MIX WEIGHT DENSITY @ 115 F Wv-a, 115 (8) (LBm/ FT^3)	VAPOR- AIR MIX SPECIFIC GRAVITY Wv-a, 115/ Wa, 115	VAPOR- AIR MIX GROWTH RATE VGR (9)
CARGO	(1)	(13)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	Wa, 115	(9)

SODIUM SULFIDE (SOLID IN WATER)	SDS	1.53	8									
STYRENE	STY	0.92	2	104.152	3.60	0.40	16.200	0.025	0.975	0.076	0.081	1.064 1.008
STYRENE CRUDE	STX	0.92	2		3.60	0.40	16.200	0.025	0.975	0.076	0.081	1.064 1.008
STYRENE TAR	STT											
TETRAMETHYLBENZENE (1,2,3,5-)	TTB	0.89	1		4.20	0.14	16.200	0.009	0.991	0.076	0.078	1.028 1.003
TOLUIDINE (o-)	TLI	1.00	1		3.69	0.01	16.200	0.001	0.999	0.076	0.076	1.002 1.000
TRICHLOROBENZENE (1,2,4-)	TCB	1.45	1		6.25	0.03	16.200	0.002	0.998	0.076	0.077	1.010 1.001
TRIISOPROPANOLAMINE SALT OF 2,4-DICHLOROPHENOXY ACETIC ACID SOL'N	TPE		8									
TRIPHENYLBORANE	UDA	0.89	1		6.42	0.00						
UNDECANOIC ACID	UDN	0.85	1		3.40	4.40	16.200	0.272	0.728	0.076	0.126	1.652 1.088
HYDROCARBON 5-9												

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE II: VAPOR-AIR MIX DENSITY,
SPECIFIC GRAVITY, & VAPOR GROWTH RATE

CARGO	C H R I S	LIQUID SPECIF. GRAVITY	USCG VAP COL. SYST CAT.	MOLEC'R WEIGHT OF CARGO MWc	SPECIF GRAV OF CARGO SGv	SATUR'D VAPOR PRESS @ 115 F Pv, 115 (15) (PSIA)	TOTAL VAP-AIR PRESS @ 115 F Pt, 115 (4) (PSIA)	PARTIAL VOLUME OF VAP @ 115 F Vv, 115 (5)	PARTIAL VOLUME OF AIR @ 115 F Va, 115 (6)	AIR WEIGHT DENSITY @ 115 F Wa, 115 (7) (LBm/ FT^3)	VAPOR- AIR MIX WEIGHT DENSITY @ 115 F Wv-a, 115 (8) (LBm/ FT^3)	VAPOR- AIR MIX SPECIFIC GRAVITY Wv-a, 115/ Wa, 115	VAPOR- AIR MIX GROWTH RATE VGR (9)
46 CFR SUBCHAPTER D, TABLE 30.25-1	***	*****	****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
Acetone	ACT	0.79	1	58.080	2.00	10.00	16.200	0.617	0.383	0.076	0.123	1.617	1.200
Acetophenone	ACP	1.03	1	120.060	4.14	0.60	16.200	0.037	0.963	0.076	0.085	1.116	1.012
Acetyl Tributyl Citrate		1.05		402.460	13.89								
Acrylonitrile-Styrene Copolymer dispersion in Polyether Polyol	ALE												
Alcohols (C13 and above)	ALY												
Alcoholic beverages, N.O.S.													
Alcohol (C6 - C17) (secondary) Poly(3-6)ethoxylates													
Alcohol (C12 - C15) Poly(1-3)ethoxylates													
Alcohol (C12 - C15) Poly(3-11)ethoxylates													
Alkenylsuccinic acid													
Alkenylsuccinic Anhydride													
Alkyl (C9 - C17) Benzenes	AKB												
Alkylbenzenesulfonic acid (4% or less)	ABS												
Alkyl Phthalates (n-)													
Alkyl Succinate Formaldehyde Hydr- oxyamino condensate (3.2% or less)													
Aminoethyldiethanolamine, Aminoethylethanolamine solution													
Amyl Acetate (commercial, iso-, n-, sec-)	AEC	0.87	1		4.50	2.02	16.200	0.125	0.875	0.076	0.109	1.436	1.040
AMYL ACETATE (n-)	AML	0.88	1		4.48	0.33	16.200	0.020	0.980	0.076	0.082	1.071	1.007
AMYL ACETATE (iso-)	IAT	0.88	1		4.48	0.33	16.200	0.020	0.980	0.076	0.082	1.071	1.007
Amyl alcohol (iso-, n-, sec-, primary) (SEE ALSO IAA)	AAI	0.82	1		3.04	0.30	16.200	0.019	0.981	0.076	0.079	1.038	1.006
Amyl alcohol (n-)	AAN	0.82	1		3.04	0.30	16.200	0.019	0.981	0.076	0.079	1.038	1.006
Amyl alcohol (tert-)	AAI												
AMYL ALCOHOL, PRIMARY	APM	0.82	1		3.04	0.30	16.200	0.019	0.981	0.076	0.079	1.038	1.006
AMYL ALCOHOL, (sec-)	ASE	0.82	1		3.04	0.30	16.200	0.019	0.981	0.076	0.079	1.038	1.006
Amylene	AMZ												
AMYL ALCOHOL, (iso-)	IAA	0.82	1		3.04	0.30	16.200	0.019	0.981	0.076	0.079	1.038	1.006
Amyl Methyl Ketone	AMK												
Amyl Tallate													
Asphalt	ASP	1.04											
ASPHALT BLENDING STOCKS: Roofers flux	ARF												
ASPHALT BLENDING STOCKS: Straight run residue	ASR												
Behenyl alcohol													
Benzene Tricarboxylic acid Trioctyl Ester													
Benzyl alcohol	BAL	1.05	1	108.140	3.73	0.10	16.200	0.006	0.994	0.076	0.077	1.017	1.002
Bicyclic Terpenel Polyamide salt													
Brake fluid base mixtures (containing Poly(2-8)alkylene (C2-C3)	gBFX												
Butane	BMX	1.03											
Butene, SEE BUTYLENE													
Butene Oligomer	BOL												

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE II: VAPOR-AIR MIX DENSITY,
SPECIFIC GRAVITY, & VAPOR GROWTH RATE

CARGO	C H R I S	LIQUID SPECIF. GRAVITY	USCG VAP COL.	MOLEC'R WEIGHT OF CARGO	SPECIF GRAV OF CARGO	SATUR'D VAPOR PRESS	TOTAL VAP-AIR PRESS	PARTIAL VOLUME OF VAP	PARTIAL VOLUME OF AIR	AIR WEIGHT DENSITY	VAPOR- AIR MIX WEIGHT DENSITY	VAPOR- AIR MIX SPECIFIC GRAVITY	VAPOR- AIR MIX GROWTH RATE
		(1)	(13)	(1)	(2)	● 115 F Pv,115 (15) (PSIA)	● 115 F Pt,115 (4) (PSIA)	● 115 F Vv,115 (5)	● 115 F Va,115 (6)	● 115 F Wa,115 (7) (LBm/ FT ³)	● 115 F Wv-a,115 (8) (LBm/ FT ³)	Wv-a,115/ Wa,115 (9)	(9)
Butyl Acetate (iso-, n-)	BAX	0.87	1	116.160	4.00	0.60	16.200	0.037	0.963	0.076	0.085	1.111	1.012
BUTYL ACETATE (N-)	BCN	0.88	1		4.00	0.80	16.200	0.049	0.951	0.076	0.087	1.148	1.016
Butyl Acetate (sec-)	BTB	0.89	1		4.00	1.50	16.200	0.093	0.907	0.076	0.097	1.278	1.030
Butyl alcohol (iso-, n-, sec-, tert-)			1		2.60	0.90	16.200	0.056	0.944	0.076	0.083	1.089	1.018
BUTYL ALCOHOL (ISO-)	IAL	0.81	1		2.60	0.90	16.200	0.056	0.944	0.076	0.083	1.089	1.018
BUTYL ALCOHOL (N-)	BAN	0.81	1		2.60	0.50	16.200	0.031	0.969	0.076	0.080	1.049	1.010
BUTYL ALCOHOL (SEC-)	BAS	0.81	1		2.60	1.30	16.200	0.080	0.920	0.076	0.086	1.128	1.026
BUTYL ALCOHOL (TERT-)	BAT	0.78	1		2.60	2.80	16.200	0.173	0.827	0.076	0.097	1.277	1.056
Butyl Benzyl Phthalate	BPH	1.12	1		10.80	0.01	16.200	0.001	0.999	0.076	0.077	1.006	1.000
Butylene	BTN												
Butylene Glycol	BUG												
1,3-Butylene Glycol, SEE BUTYLENE GLYCOL													
Butylene Polyglycol, SEE BUTYLENE GLYCOL													
iso-Butyl Formate				102.134	3.53								
n-Butyl Formate													
Butyl Heptyl Ketone	BHK												
Butyl Methyl Ketone, SEE METHYL BUTYL KETONE													
Butyl Stearate													
Butyl Toluene	BUE	0.85	1		5.11	0.10	16.200	0.006	0.994	0.076	0.078	1.025	1.002
Butyrolactone (gamma)	BLA												
Calcium Alkylphenate													
Calcium Alkyl Salicylate													
Calcium Amino Nonyl Phenolate													
Calcium Carboxylate													
Caprolactam solutions	CLS	1.02	1		3.90	0.05	16.200	0.003	0.997	0.076	0.077	1.009	1.001
Carbon black base		0.90											
Cetyl alcohol (HEXADECANOL) SEE ALCOHOLS (C13 AND ABOVE)													
Cetyl-Stearal alcohol													
Cleaning spirit (unleaded)													
Coal tar	COR	1.11											
Cumene	CUM	0.86	1	120.090	4.20	0.60	16.200	0.037	0.963	0.076	0.085	1.119	1.012
Cycloaliphatic resins													
Cyclohexane	CHX	0.78	1	84.162	2.90	4.50	16.200	0.278	0.722	0.076	0.116	1.528	1.090
Cyclohexanol	CHN	0.95	1	100.160	3.45	0.15	16.200	0.009	0.991	0.076	0.078	1.023	1.003
1,3-Cyclopentadiene dimer (molten)	CPD	0.69	2		4.55	0.25	16.200	0.015	0.985	0.076	0.080	1.055	1.005
Cyclopentadiene polymers, SEE 1,3-CYCLOPENTADIENE DIMER (MOLTEN)													
Cymene (para-)	CMP	0.86	1		4.62	0.11	16.200	0.007	0.993	0.076	0.078	1.025	1.002
Decahydronaphthalene	DHN	0.89	1		4.76	0.10	16.200	0.006	0.994	0.076	0.078	1.023	1.002
Decaldehyde (iso-)	IDA	0.83	1		5.00	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
Decaldehyde (n-)	DAL	0.83	1		5.01	0.00							
Decane	DDC												
Decene	DCE	0.74	1		4.80	0.12	16.200	0.007	0.993	0.076	0.078	1.028	1.002

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE II: VAPOR-AIR MIX DENSITY,
SPECIFIC GRAVITY, & VAPOR GROWTH RATE

CARGO	C H R I S	LIQUID SPECIF. GRAVITY	USCG VAP COL.	MOLEC'R WEIGHT OF CARGO	SPECIF GRAV OF CARGO	SATUR'D VAPOR PRESS	TOTAL VAP-AIR PRESS	PARTIAL VOLUME OF VAP	PARTIAL VOLUME OF AIR	AIR WEIGHT DENSITY	VAPOR- AIR MIX WEIGHT DENSITY	VAPOR- AIR MIX SPECIFIC GRAVITY	VAPOR- AIR MIX GROWTH RATE
		(1)	(13)	(1)	(2)	115 F Pv, 115 (3) (PSIA)	115 F Pt, 115 (4) (PSIA)	115 F Vv, 115 (5)	115 F Va, 115 (6)	115 F Wa, 115 (7) (LBm/ FT ³)	115 F Wv-a, 115 (8) (LBm/ FT ³)	115 F Wv-a, 115/ Wa, 115 (9)	(9)
Decyl alcohol (all isomers) (DECANOL)	DAX	0.83	1	158.170	5.30	0.01	16.200	0.001	0.999	0.076	0.076	1.003	1.000
DECYL ALCOHOL (iso-)	ISA	0.83	1		5.30	0.01	16.200	0.001	0.999	0.076	0.076	1.003	1.000
DECYL ALCOHOL (n-)	DAN	0.83	1		5.30	0.01	16.200	0.001	0.999	0.076	0.076	1.003	1.000
Decylbenzene (n-)	DBZ	0.86	1		7.52	0.01	16.200	0.001	0.999	0.076	0.076	1.004	1.000
Detergent Alkylate													
Diacetone alcohol	DAA	0.97	1		4.00	0.10	16.200	0.006	0.994	0.076	0.078	1.019	1.002
Dialkyl (C10-C14) Benzenes	DAB												
Dialkyl (C7-C13) Phthalates	DAH												
Dibutyl Carbinol													
Dibutyl Phthalate (ortho-)	DPA	1.05	1	278.350	9.59	0.00							
Dicyclopentadiene, SEE 1,3-CYCLOPENTADIENE DIMER (MOLTEN)	DPT	0.98	2		4.55	0.25	16.200	0.015	0.985	0.076	0.080	1.055	1.005
Diethylbenzene	DEB	0.87	1		4.62	0.08	16.200	0.005	0.995	0.076	0.078	1.018	1.002
Diethylene Glycol	DEG	1.12	1	106.122	3.66	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
Diethylene Glycol Butyl Ether	DME	0.95	1		5.50	0.01	16.200	0.001	0.999	0.076	0.076	1.003	1.000
Diethylene Glycol Butyl Ether Acetate	DEM												
Diethylene Glycol Dibutyl Ether	DIG												
Diethylene Glycol Diethyl Ether													
Diethylene Glycol Ethyl Ether	DGE												
Diethylene Glycol Ethyl Ether Acetate	DGA	0.99	1		4.62	0.02	16.200	0.001	0.999	0.076	0.076	1.004	1.000
Diethylene Glycol Methyl Ether	DGM	1.03	1		4.14	0.03	16.200	0.002	0.998	0.076	0.077	1.006	1.001
Diethylene Glycol Methyl Ether Acetate	DGR												
Diethylene Glycol Phenyl Ether	DGP												
Diethylene Glycol Phthalate	DGL												
Di-(2-ethylhexyl)adipate	DEH												
Di-(2-ethylhexyl)phthalate	DIE												
Diethyl Phthalate	DPH												
Diglycidyl Ether of Bisphenol A	BDE												
Diheptyl Phthalate	DHP												
Dihexyl Phthalate	DHA												
Diisobutylcarbinol	DBC	0.81	1		4.97	0.09	16.200	0.006	0.994	0.076	0.078	1.022	1.002
Diisobutylene	DBL	0.72	1		3.86	2.00	16.200	0.123	0.877	0.076	0.103	1.353	1.040
Diisobutyl Ketone	DIK	0.81	1		4.90	0.16	16.200	0.010	0.990	0.076	0.079	1.039	1.003
Diisobutyl Phthalate	DIT												
Diisodecyl Phthalate	DID												
Diisononyl Adipate	DNY												
Diisononyl Phthalate	DIN												
Diisooctyl Phthalate	DIO												
Diisopropylbenzene (all isomers)	DIX	0.86	1		5.60	0.03	16.200	0.002	0.998	0.076	0.077	1.009	1.001
Diisopropyl Naphthalene	DII												
Dimethyl Adipate	DLA												
Dimethylbenzene													
Dimethyl Glutarate	DGT												

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE II: VAPOR-AIR MIX DENSITY,
SPECIFIC GRAVITY, & VAPOR GROWTH RATE

CARGO	C H R I S	LIQUID SPECIF. GRAVITY (1)	USCG VAP COL. SYST CAT. (13)	MOLEC'R WEIGHT OF CARGO MWC (1)	SPECIF GRAV OF CARGO VAPOR SGV (2)	SATUR'D VAPOR PRESS @ 115 F Pv,115 (3) (PSIA)	TOTAL VAP-AIR PRESS @ 115 F Pt,115 (4) (PSIA)	PARTIAL VOLUME OF VAP @ 115 F Vv,115 (5)	PARTIAL VOLUME OF AIR @ 115 F Va,115 (6)	AIR WEIGHT DENSITY @ 115 F Wa,115 (7) (LBm/ FT^3)	VAPOR- AIR MIX WEIGHT DENSITY @ 115 F Wv-a,115 (8) (LBm/ FT^3)	VAPOR- AIR MIX SPECIFIC GRAVITY Wa,115 (9)	VAPOR- AIR MIX GROWTH RATE VGR (9)
Dimethyl Phthalate	DTL	1.19	1		6.69	0.00							
Dimethyl Polysiloxane	DMP												
2,2-Dimethylpropane-1,3-diol	DDI												
Dimethyl Succinate	DSE												
Dinonyl Phthalate	DIF	0.97	1		14.40	0.01	16.200	0.001	0.999	0.076	0.077	1.008	1.000
Di(octylphenyl)amine													
Diocetyl Phthalate	DOP	0.98	1		13.47	0.00							
Dipentene	DPN	0.84	1		4.90	0.10	16.200	0.006	0.994	0.076	0.078	1.024	1.002
Diphenyl	DIL	0.99	1	154.212	5.31	0.01	16.200	0.001	0.999	0.076	0.076	1.003	1.000
Diphenyl, Diphenyl Ether mixture	DDO	1.07	1		5.86	0.01	16.200	0.001	0.999	0.076	0.076	1.003	1.000
Diphenyl Ether	DPE	1.07	1	170.211	5.87	0.01	16.200	0.001	0.999	0.076	0.076	1.003	1.000
Diphenyl Ether, Biphenyl Ether mixture	DOB												
Dipropylene Glycol	DPG	1.03	1		4.63	0.07	16.200	0.004	0.996	0.076	0.077	1.016	1.001
Dipropylene Glycol Dibenzoate	DGY												
Dipropylene Glycol Methyl Ether	DPY												
DISTILLATES: Flashed feed stocks	DFF	0.75	1		3.40	2.30	16.200	0.142	0.858	0.076	0.102	1.341	1.046
DISTILLATES: Straight run	DSR	0.73	1		3.40	2.30	16.200	0.142	0.858	0.076	0.102	1.341	1.046
Di-tridecyl Phthalate	DTP												
Diundecyl Phthalate	DUP												
Dodecane (all isomers)	DOC			170.340	5.88								
Dodecanol	DDN			186.339	6.43								
Dodecene (all isomers)	DOZ	0.76	1	168.324	5.81	0.02	16.200	0.001	0.999	0.076	0.077	1.006	1.000
DODECENE	DOD	0.76	1		5.81	0.02	16.200	0.001	0.999	0.076	0.077	1.006	1.000
Dodecylbenzene	DDB	0.86			8.40	4.70	16.200	0.290	0.710	0.076	0.240	3.147	1.094
Dodecyl Phenol	DOL												
Drilling mud (low toxicity) (if flammable or combustible)/													
Epoxylated linear alcohols, C11-C15													
Ethane	ETH	0.47		30.070	1.04								
2-Ethoxyethanol	EEO	1.04											
2-Ethoxyethyl Acetate	EEA	1.04											
Ethoxylated alcohols, C11-C15, SEE THE ALCOHOL POLYETHOXYLATES													
Ethoxy Triglycol (crude)	ETG	1.02	1		6.14	0.00							
Ethyl Acetate	ETA	0.90	1	88.107	3.04	4.50	16.200	0.278	0.722	0.076	0.119	1.567	1.090
Ethyl Acetoacetate	EAA	1.03	1		4.48	0.20	16.200	0.012	0.988	0.076	0.079	1.043	1.004
Ethyl alcohol (ETHANOL)	EAL	0.79	1	46.050	1.60	3.50	16.200	0.216	0.784	0.076	0.086	1.130	1.070
Ethyl Amyl Ketone	EAK												
Ethyl Benzene	ETB	0.87	1	106.168	3.56	0.60	16.200	0.037	0.963	0.076	0.083	1.095	1.012
Ethyl Butanol	EBT	0.83	1		3.52	0.12	16.200	0.007	0.993	0.076	0.078	1.019	1.002
Ethyl Butyrate	EBR	0.88	1	116.160	4.00	1.00	16.200	0.062	0.938	0.076	0.090	1.185	1.020
Ethyl Cyclohexane	ECY	0.79	1		3.87	0.50	16.200	0.031	0.969	0.076	0.083	1.089	1.010
Ethylene	ETL			28.054	0.97								
Ethylene Carbonate													

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE II: VAPOR-AIR MIX DENSITY,
SPECIFIC GRAVITY, & VAPOR GROWTH RATE

CARGO	C H R I S	LIQUID SPECIF. GRAVITY (1)	USCG VAP COL. SYST CAT. (13)	MOLEC'R WEIGHT OF CARGO MWc (1)	SPECIF GRAV OF CARGO VAPOR SGv (2)	SATUR'D VAPOR PRESS @ 115 F Pv,115 (3) (PSIA)	TOTAL VAP-AIR PRESS @ 115 F Pt,115 (4) (PSIA)	PARTIAL VOLUME OF VAP @ 115 F Vv,115 (5)	PARTIAL VOLUME OF AIR @ 115 F Va,115 (6)	AIR WEIGHT DENSITY @ 115 F Wa,115 (7) (LBm/ FT ³)	VAPOR- AIR MIX WEIGHT DENSITY @ 115 F Wv-a,115 (8) (LBm/ FT ³)	VAPOR- AIR MIX SPECIFIC GRAVITY Wv-a,115/ Wa,115	VAPOR- AIR MIX GROWTH RATE VGR (9)
Ethylene Glycol	EGL	1.13	1	62.069	2.21	0.01	16.200	0.001	0.999	0.076	0.076	1.001	1.000
Ethylene Glycol Acetate	EGO												
Ethylene Glycol Butyl Ether	EGM												
ETHYLENE GLYCOL BUTYL ETHER ACETATE	EMA	0.94	1		5.52	0.05	16.200	0.003	0.997	0.076	0.077	1.014	1.001
Ethylene Glycol Ether Acetate													
Ethylene Glycol Tert-Butyl Ether	EGY	1.10	1		5.03	0.01	16.200	0.001	0.999	0.076	0.076	1.003	1.000
Ethylene Glycol Diacetate	EGB												
Ethylene Glycol Dibutyl Ether	EGF												
Ethylene Glycol Ethyl Ether, SEE 2-ETHOXYETHANOL	EGA												
Ethylene Glycol Ethyl Ether Acetate, SEE 2-ETHOXYETHYL ACETATE	EGI												
Ethylene Glycol Isopropyl Ether													
Ethylene Glycol Methyl Butyl Ether	EME	1.10	1		4.80	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
Ethylene Glycol Methyl Ether	EGT												
Ethylene Glycol Methyl Ether Acetate	EPE	1.10	1		4.80	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
Ethylene Glycol Phenyl Ether	EDX												
Ethylene Glycol Phenyl Ether, Diethylene Glycol Phenyl Ether mixt													
Ethylene-Propylene Copolymer (in liquid mixtures)													
Ethyl-3-Ethoxypropionate	EHP												
2-Ethylhexaldehyde, SEE OCTYL ALDEHYDES	EHA	0.82	1		4.41	0.17	16.200	0.010	0.990	0.076	0.079	1.036	1.003
2-Ethylhexanoic acid	EHO												
2-Ethylhexanol, SEE OCTANOL (ALL ISOMERS)	EHX	0.84	1	130.230	4.50	0.02	16.200	0.001	0.999	0.076	0.076	1.004	1.000
Ethylhexoic acid, SEE 2-ETHYLHEXANOIC ACID													
Ethyl Hexyl Phthalate (SEE ALSO DI 2-ETHYLHEXYL PHTHALATE)	EHE												
Ethyl Hexyl Tallate	EHT												
Ethyl Propionate	EPR	0.89	1		1.60	3.50	16.200	0.216	0.784	0.076	0.086	1.130	1.070
Ethyl Toluene	ETE	0.88	1		4.15	0.28	16.200	0.017	0.983	0.076	0.080	1.054	1.006
Fatty acid (saturated, C13 and above)													
Fatty acid Amides													
Formamide	FAM	1.13	1		1.55	0.10	16.200	0.006	0.994	0.076	0.076	1.003	1.002
Furfuryl Alcohol	FAL	1.13	1		3.40	0.05	16.200	0.003	0.997	0.076	0.077	1.007	1.001
Gas oil, cracked	GOC												
GASOLINE BLENDING STOCKS: Alkylates	GAK	0.75	1		3.40	12.50	16.200	0.772	0.228	0.076	0.217	2.852	1.250
GASOLINE BLENDING STOCKS: Reformates	GRF	0.80	1		3.40	12.50	16.200	0.772	0.228	0.076	0.217	2.852	1.250
GASOLINES: Automotive (containing not over 4.23 grams lead per ga	GAT	0.74	1		3.40	12.50	16.200	0.772	0.228	0.076	0.217	2.852	1.250
GASOLINES: Aviation (containing not over 4.86 grams lead per gall	GAV	0.71	1		3.40	12.50	16.200	0.772	0.228	0.076	0.217	2.852	1.250
GASOLINES: Casinghead (natural)	GCS	0.67	1		3.40	12.50	16.200	0.772	0.228	0.076	0.217	2.852	1.250
GASOLINES: Polymer	GPL	0.75	1		3.40	12.50	16.200	0.772	0.228	0.076	0.217	2.852	1.250
GASOLINES: Straight run	GSR	0.75	1		3.40	12.50	16.200	0.772	0.228	0.076	0.217	2.852	1.250
Glycerine	GCR	1.26	1		3.17	0.00							
Glycerol, SEE GLYCERINE				92.095	3.18								
Glycerol Polyalkoxylate													
Glycerol Triacetate													

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE II: VAPOR-AIR MIX DENSITY,
SPECIFIC GRAVITY, & VAPOR GROWTH RATE

C	LIQUID	USCG	MOLEC'R	SPECIF	SATUR'D	TOTAL	PARTIAL	PARTIAL	AIR	VAPOR-	VAPOR-	VAPOR-
H	SPECIF.	VAP	WEIGHT	GRAV OF	VAPOR	VAP-AIR	VOLUME	VOLUME	WEIGHT	AIR MIX	AIR	AIR
R	GRAVITY	COL.	OF	CARGO	PRESS	PRESS	OF VAP	OF AIR	DENSITY	DENSITY	MIX	MIX
I		SYST	CARGO	VAPOR	● 115 F	● 115 F	● 115 F	● 115 F	● 115 F	● 115 F	SPECIFIC	GROWTH
S		CAT.	MWc	SGv	Pv, 115	Pt, 115	Vv, 115	Va, 115	Wa, 115	Wv-a, 115	Wv-a, 115/	VGR
	(1)	(13)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	Wa, 115	(9)
					(15)	(PSIA)			(LBm/	(LBm/		
					(PSIA)				FT^3)	FT^3)		

Glycidyl Ester of Tertiary Carboxylic acid, SEE GLYCIDYL ESTER OF TRIDECYL ACETIC ACID												
Glycidyl Ester of Tridecyl Acetic acid GLT												
Glycidyl Ester of Versatic acid, SEE GLYCIDYL ESTER OF TRIDECYL ACETIC ACID												
Glycol Diacetate, SEE ETHYLENE GLYCOL DIACETATE												
Glycols, Resins and Solvents mixtures												
Gylcol Triacetate, SEE GLYCERYL TRIACETATE												
Glyoxal solution (40% or less)												
Grease												
Heptadecane												
Heptane (all isomers) (METHYHEXANE)	HMX	0.68	1	100.120	3.45	2.50	16.200	0.154	0.846	0.076	0.105	1.378 1.050
HEPTANE (N-)	HPT	0.68	1		3.45	2.50	16.200	0.154	0.846	0.076	0.105	1.378 1.050
Heptanoic acid	HEP	0.92	1		4.49	0.01	16.200	0.001	0.999	0.076	0.076	1.002 1.000
Heptanol (all isomers)	HTX	0.82	1		4.00	0.04	16.200	0.002	0.998	0.076	0.077	1.007 1.001
HEPTANOL	HTN	0.82	1		4.00	0.04	16.200	0.002	0.998	0.076	0.077	1.007 1.001
Heptene (all isomers)	HPX	0.70	2		3.40	2.90	16.200	0.179	0.821	0.076	0.109	1.430 1.058
HEPTENE (1-)	HTE	0.70	1		3.40	2.80	16.200	0.173	0.827	0.076	0.108	1.415 1.056
Heptyl Acetate	HPE	0.88	1		5.50	0.10	16.200	0.006	0.994	0.076	0.078	1.028 1.002
Herbicide (C15 -H22 -NO2 -CI), SEE METOLACHLOR												
Hexaethylene Glycol												
Hexamethylene Glycol												
Hexamethylenetetramine solutions	HTS											
Hexane (all isomers)	HXS	0.66	1	86.110	3.00	7.00	16.200	0.432	0.568	0.076	0.142	1.864 1.140
HEXANE	HXA	0.66	1		3.00	7.00	16.200	0.432	0.568	0.076	0.142	1.864 1.140
Hexanoic acid	HXO	0.93	1		4.00	0.01	16.200	0.001	0.999	0.076	0.076	1.002 1.000
Hexanol	HXN	0.82	1		3.52	1.00	16.200	0.062	0.938	0.076	0.088	1.156 1.020
Hexene (all isomers)	HEX	0.67	2	84.090	2.90	8.00	16.200	0.494	0.506	0.076	0.148	1.938 1.160
HEXENE (1-)	HXE	0.67	1		2.90	8.20	16.200	0.506	0.494	0.076	0.149	1.962 1.164
HEXENE (2-)	HXT	0.67	1		2.90	8.20	16.200	0.506	0.494	0.076	0.149	1.962 1.164
Hexyl Acetate	HAE											
Hexylene Glycol	HXG	0.92	4		1.10	0.01	16.200	0.001	0.999	0.076	0.076	1.000 1.000
Hog Grease, SEE LARD												
2-Hydroxy-4-(methylthio)butanoic acid	HBA											
HYDROCARBON 5-9 (MOVED TO SUB-O, NON TABLE 151, 6/24/95)	HPN											
Hydroxy terminated Polybutadiene, SEE POLYBUTADIENE, HYDROXYL TERMINATED/												
Isophorone	IPH	0.93	1		4.75	0.01	16.200	0.001	0.999	0.076	0.076	1.002 1.000
JET FUELS: JP-1 (Kerosene)	JPO	0.80	1		4.50	0.14	16.200	0.009	0.991	0.076	0.078	1.030 1.003
JET FUELS: JP-3	JPT	0.80	1		4.50	8.51	16.200	0.525	0.475	0.076	0.216	2.839 1.170
JET FUELS: JP-4	JPF	0.81	1		4.00	3.40	16.200	0.210	0.790	0.076	0.124	1.630 1.068
JET FUELS: JP-5 (Kerosene, heavy)	JPV	0.82	1		4.00	0.10	16.200	0.006	0.994	0.076	0.078	1.019 1.002
JET FUELS: JP-8	JPE		1									
Kerosene	KRS	0.81	1		4.50	0.15	16.200	0.009	0.991	0.076	0.079	1.032 1.003
Lactic acid												

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE II: VAPOR-AIR MIX DENSITY,
SPECIFIC GRAVITY, & VAPOR GROWTH RATE

CARGO	C H I S	LIQUID SPECIF. GRAVITY (1)	USCG VAP COL. SYST CAT. (13)	MOLEC'R WEIGHT OF CARGO MWc (1)	SPECIF GRAV OF CARGO VAPOR SGv (2)	SATUR'D VAPOR PRESS @ 115 F Pv, 115 (3) (15) (PSIA)	TOTAL VAP-AIR PRESS @ 115 F Pt, 115 (4) (PSIA)	PARTIAL VOLUME OF VAP @ 115 F Vv, 115 (5)	PARTIAL VOLUME OF AIR @ 115 F Va, 115 (6)	AIR WEIGHT DENSITY @ 115 F Wa, 115 (7) (LBm/ FT^3)	VAPOR- AIR MIX WEIGHT DENSITY @ 115 F Wv-a, 115 (8) (LBm/ FT^3)	VAPOR- AIR MIX SPECIFIC GRAVITY Wv-a, 115/ Wa, 115	VAPOR- AIR MIX GROWTH RATE VGR (9)
Lard													
Latex, liquid synthetic, including: Styrene-Butadien rubber	LLS												
Latex, liquid synthetic, including: Carboxylated Styrene-Butadien Copolymer													
Magnesium Nonyl Phenol Sulfide													
Magnesium Sulfonate	MSE												
Maleic Anhydride Copolymer													
2-Mercaptobenzothiazol (in liquid mixtures)													
Methane	MTH			16.043	0.55								
3-Methoxy-1-Butanol													
3-Methoxybutyl Acetate	MOA												
1-Methoxy-2-Propyl Acetate	MPO												
Methoxy Trigylcol, SEE TRIETHYLENE GLYCOL METHYL ETHER	MTG												
Methyl Acetate	MIT	0.92	1	74.080	2.60	6.10	16.200	0.377	0.623	0.076	0.122	1.603	1.122
Methyl Acetoacetate	MAE												
Methyl alcohol (SEE METHANOL)	MAL	0.79	1		1.10	6.63	16.200	0.409	0.591	0.076	0.079	1.041	1.133
Methyl Amyl Acetate	MAC	0.86	1		4.97	0.33	16.200	0.020	0.980	0.076	0.082	1.081	1.007
Methyl Amyl alcohol	MAA	0.81	1		3.52	0.43	16.200	0.027	0.973	0.076	0.081	1.067	1.009
Methyl Amyl Ketone	MAK			114.188	3.94								
Methyl Butanol, SEE THE AMYL ALCOHOLS													
Methyl Butenol	MBL												
Methyl n-Butyl Ketone	MBK	0.81	1	100.160	3.50	0.97	16.200	0.060	0.940	0.076	0.088	1.150	1.019
Methyl Butynol	MBY												
Methyl Butyrate	MBU	0.90	1	102.134	3.53	1.26	16.200	0.078	0.922	0.076	0.091	1.197	1.025
Methyl Ethyl Ketone	MEK	0.80	1	72.107	2.50	4.50	16.200	0.278	0.722	0.076	0.108	1.417	1.090
Methyl Formal (DIMETHYL FORMAL)	MTF	0.86	1		2.60	15.42	16.200	0.952	0.048	0.076	0.192	2.523	1.308
Methyl Heptyl Ketone	MHK	0.83	1		4.90	0.06	16.200	0.004	0.996	0.076	0.077	1.014	1.001
Methyl Isobutyl Carbinol, SEE METHYL AMYL ALCOHOL	MIC	0.84											
Methyl Isobutyl Ketone	MIK	0.80	1	100.160	3.45	1.15	16.200	0.071	0.929	0.076	0.089	1.174	1.023
3-Methyl-3-Methoxybutanol													
3-Methyl-3-Methoxybutyl Acetate													
1-Methyl Naphthalene	MNA	1.02	1		4.91	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
Methyl Pentene													
2-METHYL-1-PENTENE	MPN	0.69	1		2.90	6.30	16.200	0.389	0.611	0.076	0.132	1.739	1.126
5-METHYL-1-PENTENE	MTN	0.67	1		2.90	8.49	16.200	0.524	0.476	0.076	0.152	1.996	1.170
N-Methyl-2-Pyrrolidone	MPY												
Methyl Tert-Butyl Ether (MTBE)	MBE	0.74	1		3.10	0.04	16.200	0.002	0.998	0.076	0.077	1.005	1.001
Metolachlor	MCO												
Mineral spirits	MNS	0.75	1		4.30	0.20	16.200	0.012	0.988	0.076	0.079	1.041	1.004
Myrcene	MRE	0.80	1		4.70	0.17	16.200	0.010	0.990	0.076	0.079	1.039	1.003
NAPHTHA: Aromatic (Having less than 10% Benzene)		.6	.85	1									
NAPHTHA: Cracking fraction		.6	.85	1									
NAPHTHA: Heavy		.6	.85	1									

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE II: VAPOR-AIR MIX DENSITY,
SPECIFIC GRAVITY, & VAPOR GROWTH RATE

CARGO	CHRS	LIQUID SPECIF. GRAVITY	USCG VAP COL. SYST CAT.	MOLEC'R WEIGHT OF CARGO MWC	SPECIF GRAV OF CARGO VAPOR SGV	SATUR'D VAPOR PRESS @ 115 F (3)	TOTAL VAP-AIR PRESS @ 115 F (4)	PARTIAL VOLUME OF VAP @ 115 F (5)	PARTIAL VOLUME OF AIR @ 115 F (6)	AIR WEIGHT DENSITY @ 115 F (7)	VAPOR-AIR MIX WEIGHT DENSITY @ 115 F (8)	VAPOR-AIR MIX SPECIFIC GRAVITY @ 115 F (9)	VAPOR-AIR MIX GROWTH RATE (10)
		(1)	(13)	(1)	(2)	(15) (PSIA)	(PSIA)	(5)	(6)	(LBm/FT ³)	(LBm/FT ³)	Wa, 115	(9)
NAPHTHA: Paraffinic	PTN	.6 -.85	1										
NAPHTHA: Petroleum	NSV	.6 -.85	1										
NAPHTHA: Solvent	NSS	0.87	1		3.50	0.20	16.200	0.012	0.988	0.076	0.078	1.031	1.004
NAPHTHA: Stoddard solvent	NVM	0.78	1		4.30	0.20	16.200	0.012	0.988	0.076	0.079	1.041	1.004
NAPHTHA: Varnish makers' and painters' (75%)	NFS	0.77	1		4.30	0.19	16.200	0.012	0.988	0.076	0.079	1.039	1.004
Naphthalene Sulfonic acid-Formaldehyde Copolymer, Sodium salt	NTI	1.02											
Naphthenic acid	NAX	0.72	1	128.259	4.40	0.27	16.200	0.017	0.983	0.076	0.080	1.057	1.005
Nonane (all isomers)	NAN	0.72	1		4.40	0.27	16.200	0.017	0.983	0.076	0.080	1.057	1.005
NONANE	NNA												
Nonanoic acid (all isomers)	NON	0.73	2	126.140	4.30	0.35	16.200	0.022	0.978	0.076	0.082	1.071	1.007
Nonanoic, Tridecanoic acid mixture	NNS	0.94	1	144.160	5.00	0.10	16.200	0.006	0.994	0.076	0.078	1.025	1.002
Nonene	NNN	0.94	1		5.00	0.10	16.200	0.006	0.994	0.076	0.078	1.025	1.002
Nonyl alcohol (all isomers)	NNI	0.94	1		5.00	0.10	16.200	0.006	0.994	0.076	0.078	1.025	1.002
NONYL ALCOHOL	NNP	0.95	1		7.60	0.01	16.200	0.001	0.999	0.076	0.076	1.004	1.000
NONYL ALCOHOL (iso-)	NPE												
Nonyl Methacrylate Monomer													
Nonyl Phenol													
Nonyl Phenol Poly(4-12)ethoxylates													
Nonyl Phenol Sulfide (90% or less)													
Noxious liquid, N.O.S. (17) ("Trade name," contains "principal components"), Category D (if f													
Non-Noxious liquid, N.O.S. (18) ("Trade name," contains principal components"), Appendix III													
Octadecene	ODD												
Octadecenoamide solution (Oleamide)	OAX	0.70	1		3.90	0.79	16.200	0.049	0.951	0.076	0.087	1.141	1.016
Octane (all isomers)	OAN	0.70			3.90	0.79	16.200	0.049	0.951	0.076	0.087	1.141	1.016
OCTANE	OAA	0.91	1		5.00	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
Octanoic acid (all isomers)	OCK	0.83	1		4.48	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
Octanol (all isomers)	OTA	0.83	1		4.48	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
OCTANOL	OTX	0.72	2	122.200	3.90	0.90	16.200	0.056	0.944	0.076	0.088	1.161	1.018
Octene (all isomers)	OTE	0.72	1		3.86	1.00	16.200	0.062	0.938	0.076	0.090	1.177	1.020
OCTENE (1-)													
Octyl Acetate	OCK	0.83	1		4.48	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
Octyl alcohol (iso-, n-) (all isomers), SEE OCTANOL (ALL ISOMERS)	IOA	0.83	1		4.48	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
OCTYL ALCOHOL	OAL												
Octyl Aldehydes	ODA												
Octyl Decyl Adipate	OET												
Octyl Epoxytallate													
Octyl Phthalate. SEE DI-(2-ETHYLHEXYL) PHTHALATE													
OIL, EDIBLE: Babassu	OBH												
OIL, EDIBLE: Beechnut													
OIL, EDIBLE: Castor	OCA												
OIL, EDIBLE: Cocoa butter													
OIL, EDIBLE: Coconut	OCC	0.95											

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE II: VAPOR-AIR MIX DENSITY,
SPECIFIC GRAVITY, & VAPOR GROWTH RATE

C H R I S	LIQUID SPECIF. GRAVITY	USCG VAP COL. SYST CAT.	MOLEC'R WEIGHT OF CARGO MWc	SPECIF GRAV OF CARGO VAPOR SGv	SATUR'D VAPOR PRESS @ 115 F Pv,115 (3) (15) (PSIA)	TOTAL VAP-AIR PRESS @ 115 F Pt,115 (4) (PSIA)	PARTIAL VOLUME OF VAP @ 115 F Vv,115 (5)	PARTIAL VOLUME OF AIR @ 115 F Va,115 (6)	AIR WEIGHT DENSITY @ 115 F Wa,115 (7) (LBm/ FT ³)	VAPOR- AIR MIX WEIGHT DENSITY @ 115 F Wv-a,115 (8) (LBm/ FT ³)	VAPOR- AIR MIX SPECIFIC GRAVITY Wa,115 (9)	VAPOR- AIR MIX GROWTH RATE VGR (9)
CARGO	(1)	(13)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(9)
-----	***	*****	****	*****	*****	-----	-----	-----	-----	*****	*****	*****
OIL, EDIBLE: Cod liver												
OIL, EDIBLE: Corn	OCO	0.96										
OIL, EDIBLE: Cottonseed	OCS											
OIL, EDIBLE: Fish, N.O.S.	OFS	0.96										
OIL, EDIBLE: Grapeseed												
OIL, EDIBLE: Groundnut												
OIL, EDIBLE: Hazelnut												
OIL, EDIBLE: Lard	OLD											
OIL, EDIBLE: Maize												
OIL, EDIBLE: Mustard seed												
OIL, EDIBLE: Nutmeg Butter												
OIL, EDIBLE: Olive	OOL											
OIL, EDIBLE: Palm	OPM											
OIL, EDIBLE: Palm kernel	OPO											
OIL, EDIBLE: Peanut	OPN											
OIL, EDIBLE: Poppy												
OIL, EDIBLE: Raisin seed												
OIL, EDIBLE: Rice bran	ORP											
OIL, EDIBLE: Safflower	OSF											
OIL, EDIBLE: Salad												
OIL, EDIBLE: Sesame												
OIL, EDIBLE: Soya bean	OSB	0.96										
OIL, EDIBLE: Sunflower, SEE SUNFLOWER SEED		0.95										
OIL, EDIBLE: Sunflower seed	OSN											
OIL, EDIBLE: Tucum	OTC											
OIL, EDIBLE: Vegetable, N.O.S.	OVG	0.96										
OIL, EDIBLE: Walnut												
OIL, FUEL: No. 1 (Kerosene)	OON											
OIL, FUEL: No. 1-D	OOD											
OIL, FUEL: No. 2	OTW	0.88	1	8.00	0.56	16.200	0.035	0.965	0.076	0.095	1.242	1.011
OIL, FUEL: No. 2-D	OTD											
OIL, FUEL: No. 4	OFR	0.90	1	3.40	0.15	16.200	0.009	0.991	0.076	0.078	1.022	1.003
OIL, FUEL: No. 5	OFV	0.94	1	3.40	0.15	16.200	0.009	0.991	0.076	0.078	1.022	1.003
OIL, FUEL: No. 6	OSX	0.95	1	3.40	0.15	16.200	0.009	0.991	0.076	0.078	1.022	1.003
OIL, MISC: Absorption	OAS											
OIL, MISC: Aliphatic												
OIL, MISC: Animal, N.O.S.												
OIL, MISC: Aromatic												
OIL, MISC: Aviation F2300												
OIL, MISC: Clarified	OCF											
OIL, MISC: Coal												
OIL, MISC: Coconut oil, esterified, SEE COCONUT OIL, FATTY ACID METHYL ESTER												

STDVAP1

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE II: VAPOR-AIR MIX DENSITY,
SPECIFIC GRAVITY, & VAPOR GROWTH RATE

CARGO	C	LIQUID	USCG	MOLEC'R	SPECIF	SATUR'D	TOTAL	PARTIAL	PARTIAL	AIR	VAPOR-	VAPOR-	VAPOR-
	H	SPECIF.	VAP	WEIGHT	GRAV OF	VAPOR	VAP-AIR	VOLUME	VOLUME	WEIGHT	AIR MIX	AIR	AIR
	R	GRAVITY	COL.	OF	CARGO	PRESS	PRESS	OF VAP	OF AIR	DENSITY	WEIGHT	MIX	MIX
	I		SYST	CARGO	VAPOR	@ 115 F	@ 115 F	@ 115 F	@ 115 F	@ 115 F	@ 115 F	SPECIFIC	GROWTH
	S		CAT.	MWc	SGv	Pv, 115	Pt, 115	Vv, 115	Va, 115	Wa, 115	Wv-a, 115	Wv-a, 115/	VGR
		(1)	(13)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	Wa, 115	(9)
						(15)	(PSIA)			(LBm/	(LBm/		
						(PSIA)				FT^3)	FT^3)		

OIL, MISC: Coconut oil, fatty acid													
OIL, MISC: Coconut oil, fatty acid Methyl Ester													
OIL, MISC: Coconut oil, Methyl Ester, SEE COCONUT OIL FATTY ACID METHYL ESTER													
OIL, MISC: Cottonseed, fatty acid, SEE COTTONSEED OIL, FATTY ACIDCFY													
OIL, MISC: Croton													
OIL, MISC: Crude		OIL	0.95	1		3.40	0.15	16.200	0.009	0.991	0.076	0.078	1.022 1.250
OIL, MISC: Diesel		ODS	0.90	1		3.40	0.69	16.200	0.043	0.957	0.076	0.084	1.102 1.014
OIL, MISC: Gas, low pour													
OIL, MISC: Gas, low sulfur													
OIL, MISC: Heartcut distillate													
OIL, MISC: Lanolin													
OIL, MISC: Linseed													
OIL, MISC: Lubricating		OLB	0.90	1		1.00	0.15	16.200	0.009	0.991	0.076	0.076	1.000 1.003
OIL, MISC: Mineral													
OIL, MISC: Mineral seal		OMS											
OIL, MISC: Motor		OMT											
OIL, MISC: Neatsfoot		ONF											
OIL, MISC: Oiticica		OOI											
OIL, MISC: Palm oil, fatty acid Methyl Ester		OPE	0.95										
OIL, MISC: Palm oil, Methyl Ester, SEE SEE PALM OIL, FATTY ACID MOPE		MOPE											
OIL, MISC: Penetrating		OPT											
OIL, MISC: Perilla													
OIL, MISC: Pilchard													
OIL, MISC: Pine		OPI											
OIL, MISC: Range		ORG											
OIL, MISC: Residual													
OIL, MISC: Resin		ORS	1.02	1		1.00	0.15	16.200	0.009	0.991	0.076	0.076	1.000 1.003
OIL, MISC: Resinous petroleum													
OIL, MISC: Road		ORD											
OIL, MISC: Rosin		ORN											
OIL, MISC: Seal													
OIL, MISC: Soapstock		OIS											
OIL, MISC: Soya bean (epoxidized)													
OIL, MISC: Sperm		OSP											
OIL, MISC: Spindle		OSD											
OIL, MISC: Spray		OSY											
OIL, MISC: Tall		OTL											
OIL, MISC: Tall, fatty acid		TOF											
OIL, MISC: Tanner's		OTN											
OIL, MISC: Transformer		OTF											
OIL, MISC: Tung		OTG											
OIL, MISC: Turbine		OTB	0.87	1		5.40	0.30	16.200	0.019	0.981	0.076	0.082	1.082 1.006

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE II: VAPOR-AIR MIX DENSITY,
SPECIFIC GRAVITY, & VAPOR GROWTH RATE

C	LIQUID	USCG	MOLEC'R	SPECIF	SATUR'D	TOTAL	PARTIAL	PARTIAL	AIR	VAPOR-	VAPOR-	VAPOR-
H	SPECIF.	VAP	WEIGHT	GRAV OF	VAPOR	VAP-AIR	VOLUME	VOLUME	WEIGHT	AIR MIX	AIR	AIR
R	GRAVITY	COL.	OF	CARGO	PRESS	PRESS	OF VAP	OF AIR	DENSITY	WEIGHT	MIX	MIX
I		SYST	CARGO	VAPOR	@ 115 F	@ 115 F	@ 115 F	@ 115 F	@ 115 F	@ 115 F	SPECIFIC	GROWTH
S		CAT.	MWc	SGv	Pv, 115	Pt, 115	Vv, 115	Va, 115	Wa, 115	Wv-a, 115	Wv-a, 115/	VGR
	(1)	(13)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	Wa, 115	(9)
					(15)				(LBm/	(LBm/		
					(PSIA)	(PSIA)			FT^3)	FT^3)		

OIL, MISC: Whale												
OIL, MISC: White (mineral)												
OIL, MISC: Wood												
alpha-Olefins (C13 - C18)												
Olefins (C13 and above, all isomers)												
Oleic acid												
Oleyl alcohol (OCTADECENOL), SEE ALCOHOLS (C13 AND ABOVE)												
Organic Amine 70, SEE AMINOETHYLDIETHANOLAMINE, AMINOETHYL-ETHANOLAMINE SOLUTION												
Palm Stearin												
n-Paraffins (C10 - C20)												
Pentadecanol, SEE SEE ALCOHOLS (C13 AND ABOVE)												
Pentaethylene Glycol												
Pentaethylenhexamine												
Pentane (all isomers)												
PENTANE (iso-)												
PENTANE (n-)												
Pentanoic acid												
Pentene (all isomers)												
PENTENE (1-)												
Petrolatum												
1-Phenyl-1-Xylol Ethane												
Phosphosulfurized Bicyclic Terpene												
Phthalate plasticizers, SEE INDIVIDUAL PHTHALATES												
Pinene												
Polyalkenyl Succinic Anhydride Amine												
Polyalkylene Glycols, Polyalkylene Glycol Monoalkyl Ethers mixtur												
Polyalkylene Oxide Polyol												
Polamine, Amide mixture												
Polybutadiene, Hydroxyl terminated												
Polybutene												
Polydimethylsiloxane												
Polyethylene Glycol												
Polyethylene Glycol Dimethyl Ether												
Polyglycerol												
Polyisobutylene, SEE POLYBUTENE												
Polymerized Esters												
Poly(20)oxyethylene Sorbitan Monooleate												
Polypropylene												
Polypropylene Glycol												
Polypropylene Glycol Methyl Ether												
Polysiloxane												
Polystyrene Diakyl Maleate												

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE II: VAPOR-AIR MIX DENSITY,
SPECIFIC GRAVITY, & VAPOR GROWTH RATE

CARGO	C H I S	LIQUID SPECIF. GRAVITY	USCG VAP COL. SYST CAT.	MOLEC'R WEIGHT OF CARGO MWC	SPECIF GRAV OF CARGO VAPOR SGv	SATUR'D VAPOR PRESS ● 115 F Pv,115 (3) (15) (PSIA)	TOTAL VAP-AIR PRESS ● 115 F Pt,115 (4) (PSIA)	PARTIAL VOLUME OF VAP ● 115 F Vv,115 (5)	PARTIAL VOLUME OF AIR ● 115 F Va,115 (6)	AIR WEIGHT DENSITY ● 115 F Wa,115 (7) (LBm/ FT^3)	VAPOR- AIR MIX WEIGHT DENSITY ● 115 F Wv-a,115 (8) (LBm/ FT^3)	VAPOR- AIR MIX SPECIFIC GRAVITY Wv-a,115/ Wa,115	VAPOR- AIR MIX GROWTH RATE VGR (9)
-----	***	*****	***	*****	*****	*****	-----	-----	-----	-----	*****	*****	*****
Potassium Oleate	POE												
Propane	PRP	1.04		44.094	1.52								
n-Propoxypropanol	PKP												
Propyl Acetate (iso-)	IAC	0.89	1		3.52	1.80	16.200	0.111	0.889	0.076	0.097	1.280	1.036
Propyl Acetate (n-)	PAT	0.00	1		3.52	1.85	16.200	0.114	0.886	0.076	0.098	1.288	1.037
Propyl alcohol (iso-)	IPA	0.79	1		2.07	3.00	16.200	0.185	0.815	0.076	0.091	1.198	1.060
Propyl alcohol (n-)	PAL	0.80	1		2.07	1.20	16.200	0.074	0.926	0.076	0.082	1.079	1.024
Propylbenzene (n-)	PBZ	0.86	1	60.060	4.14	0.20	16.200	0.012	0.988	0.076	0.079	1.039	1.004
iso-Propylcyclohexane	IPX	0.80	1	126.243	4.35	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
Propylene	PPL	1.04		42.081	1.45								
Propylene-Butylene Copolymer	PBP												
Propylene Dimer	PDR												
Propylene Glycol (1,2-PROPANDIOL)	PPG	1.04	1	76.060	2.62	0.01	16.200	0.001	0.999	0.076	0.076	1.001	1.000
Propylene Glycol Monoalkyl Ether	PGE												
Propylene Glycol Ethyl Ether	PGY												
Propylene Glycol Methyl Ether	PME	0.92	1		3.11	0.70	16.200	0.043	0.957	0.076	0.083	1.091	1.014
Propylene Polymer (in liquid mixtures)													
Propylene Tetramer	PTT	0.29		156.310	1.00	0.02	16.200	0.001	0.999	0.076	0.076	1.000	1.000
Propylene Trimer	PTR												
Pseudocumene, SEE TRIMETHYLBENZENES													
Rum													
Sodium Acetate, Glycol, water solutions													
Sodium Acetate solution	SAN												
Sodium Benzoate solution	SBN												
Sodium Sulfonate													
Stearic acid	SRA												
Stearyl alcohol (Octadecanol)													
Sulfolane	SFL	1.26	1		4.14	0.01	16.200	0.001	0.999	0.076	0.076	1.002	1.000
Tallow	TLO												
Tallow alcohol, SEE ALCOHOLS (C13 AND ABOVE)													
Tallow fatty acid	TFD												
Tallow Alkyl Nitrile													
Tetradecanol	TTN	0.82	1		7.39	0.00							
1-Tetradecene, SEE THE OLEFIN OR ALPHA-OLEFIN ENTRIES	TTD	0.77	1		6.77	0.01	16.200	0.001	0.999	0.076	0.076	1.004	1.000
Tetradecylbenzene	TBD												
Tetraethylene Glycol	TTG	1.12	1		6.70	0.01	16.200	0.001	0.999	0.076	0.076	1.004	1.000
Tetrahydronaphthalene	THN	0.97	1		4.56	0.04	16.200	0.002	0.998	0.076	0.077	1.009	1.001
Tetrapropylbenzene, SEE ALKYL(C9-C17) BENZENES													
Toluene	TOL	0.87	1	92.141	3.14	1.50	16.200	0.093	0.907	0.076	0.091	1.198	1.030
Triaryphosphate													
Tributyl Phosphate	TBP												
Tricresyl Phosphate (less than 1% of the ortho isomer)	TCP	1.16	1		12.69	0.01	16.200	0.001	0.999	0.076	0.077	1.007	1.000

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE II: VAPOR-AIR MIX DENSITY,
SPECIFIC GRAVITY, & VAPOR GROWTH RATE

C H I S	LIQUID SPECIF. GRAVITY	USCG VAP COL. SYST CAT.	MOLEC'R WEIGHT OF CARGO MWC	SPECIF GRAV OF CARGO VAPOR SGv	SATUR'D VAPOR PRESS ● 115 F (3) (15) (PSIA)	TOTAL VAP-AIR PRESS ● 115 F Pt, 115 (4) (PSIA)	PARTIAL VOLUME OF VAP ● 115 F Vv, 115 (5)	PARTIAL VOLUME OF AIR ● 115 F Va, 115 (6)	AIR WEIGHT DENSITY ● 115 F Wa, 115 (7) (LBm/ FT ³)	VAPOR- AIR MIX WEIGHT DENSITY ● 115 F Wv-a, 115 (8) (LBm/ FT ³)	VAPOR- AIR MIX SPECIFIC GRAVITY Wv-a, 115/ Wa, 115	VAPOR- AIR MIX GROWTH RATE VGR (9)
CARGO	(1)	(13)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(9)
Tridecane	TRD	0.76	1	6.40	0.02	16.200	0.001	0.999	0.076	0.077	1.007	1.000
Tridecanoic acid												
Tridecanol, SEE ALCOHOLS (C13 AND ABOVE)	TDN	0.85	1	6.91	0.01	16.200	0.001	0.999	0.076	0.076	1.004	1.000
1-Tridecene	TDC	0.77	1	6.29	0.01	16.200	0.001	0.999	0.076	0.076	1.003	1.000
Tridecylbenzene	TRB											
Triethylbenzene	TEB	0.86	1	5.60	0.02	16.200	0.001	0.999	0.076	0.077	1.006	1.000
Triethylene Glycol	TEG	1.12	1	5.17	0.01	16.200	0.001	0.999	0.076	0.076	1.003	1.000
Triethylene Glycol Butyl Ether												
Triethylene Glycol Butyl Ether mixture		1.04										
Triethylene Glycol di-(2-ethylbutyrate)	TGD											
Triethylene Glycol Ether mixture												
Triethylene Glycol Ethyl Ether	TGE											
Triethylene Glycol Methyl Ether												
Triethyl Phosphate	TPS	1.07		6.28	0.02	16.200	0.001	0.999	0.076	0.077	1.007	1.000
Triisooctyl Trimellitate												
Triisopropanolamine	TIP	1.02	8	191.270	6.60							
Trimethylbenzenes (all isomers)	TRE	0.89	1	4.20	0.14	16.200	0.009	0.991	0.076	0.078	1.028	1.003
TRIMETHYL BENZENE (1,2,5-)	TMB	0.89	1	4.14	0.14	16.200	0.009	0.991	0.076	0.078	1.027	1.003
TRIMETHYL BENZENE (1,2,3-)	TMD	0.89	1	4.14	0.14	16.200	0.009	0.991	0.076	0.078	1.027	1.003
TRIMETHYL BENZENE (1,2,4-) (PSEUDOCUMENE)	TME	0.89	1	4.14	0.14	16.200	0.009	0.991	0.076	0.078	1.027	1.003
Trimethylol Propane Polyethoxylate	TPR											
2,2,4-Trimethyl pentanediol-1,3-diisobutyrate												
2,2,4-Trimethyl-3-pentanol-1-isobutyrate	TMP											
Tripropylene, SEE PROPYLENE TRIMER												
Tripropylene Glycol	TGC											
Tripropylene Glycol Methyl Ether	TGM											
Trixylenyl Phosphate	TRP	1.16	1	14.20	0.00							
Turpentine	TPT											
Turpentine substitute (White spirit), SEE WHITE SPIRIT (LOW (15-20%) AROMATIC)												
Undecanol												
Undecene (1-)	UDC	0.75	1	5.32	0.05	16.200	0.003	0.997	0.076	0.077	1.013	1.001
Undecyl alcohol	UND	0.84	1	5.94	0.01	16.200	0.001	0.999	0.076	0.076	1.003	1.000
Undecylbenzene	UDB											
Vinyl Acetate-fumerate Copolymer												
Waxes:	WAX											
WAXES: Candelilla												
WAXES: Carnauba	WAX, WCA											
WAXES: Paraffin	WAX, WPF											
WAXES: Petroleum												
White spirit, SEE WHITE SPIRIT (LOW (15-20%) AROMATIC)												
White spirit (low (15 - 20%) aromatic)	WSL											
Wine, SEE ALCOHOLIC BEVERAGES, N.O.S.												

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE II: VAPOR-AIR MIX DENSITY,
SPECIFIC GRAVITY, & VAPOR GROWTH RATE

CARGO	C	LIQUID	USCG	MOLEC'R	SPECIF	SATUR'D	TOTAL	PARTIAL	PARTIAL	AIR	VAPOR-	VAPOR-	VAPOR-
	H	SPECIF.	VAP	GRAV OF	VAPOR	VAPOR	VAP-AIR	VOLUME	VOLUME	WEIGHT	AIR MIX	AIR	AIR
	R	GRAVITY	COL.	OF	CARGO	PRESS	PRESS	OF VAP	OF AIR	DENSITY	WEIGHT	MIX	MIX
	I		SYST	CARGO	VAPOR	@ 115 F	@ 115 F	@ 115 F	@ 115 F	@ 115 F	@ 115 F	GRAVITY	RATE
	S	(1)	(13)	MWc	SGv	Pv,115	Pt,115	Vv,115	Va,115	Wa,115	Wv-a,115	Wv-a,115/	VGR
						(15)	(4)	(5)	(6)	(7)	(8)	Wa,115	(9)
						(PSIA)	(PSIA)			(LBm/ FT^3)	(LBm/ FT^3)		
Wool grease	***	*****	***	*****	*****	*****	-----	-----	-----	-----	*****	*****	*****
Xylenes (ortho-, meta-, para-)	XLX	0.89	1	106.168	3.66	0.51	16.200	0.031	0.969	0.076	0.083	1.084	1.010
XYLENE (M-)	XLM	0.87	1		3.66	0.51	16.200	0.031	0.969	0.076	0.083	1.084	1.010
XYLENE (O-)	XLO	0.89	1		3.66	0.40	16.200	0.025	0.975	0.076	0.081	1.066	1.008
XYLENE (P-)	XLP	0.86	1		3.66	0.51	16.200	0.031	0.969	0.076	0.083	1.084	1.010
XYLENOL	XYL	1.01	1		3.66	0.10	16.200	0.006	0.994	0.076	0.077	1.016	1.002
Zinc Dialkylidithiophosphate													

E-L-u

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE II: VAPOR-AIR MIX DENSITY,
SPECIFIC GRAVITY, & VAPOR GROWTH RATE

CARGO	C	LIQUID	USCG	MOLEC'R	SPECIF	SATUR'D	TOTAL	PARTIAL	PARTIAL	AIR	VAPOR-	VAPOR-	VAPOR-
	H	SPECIF.	VAP	WEIGHT	GRAV OF	VAPOR	VAP-AIR	VOLUME	VOLUME	WEIGHT	AIR MIX	AIR	AIR
	R	GRAVITY	COL.	OF	CARGO	PRESS	PRESS	OF VAP	OF AIR	DENSITY	WEIGHT	MIX	MIX
	I		SYST	CARGO	VAPOR	● 115 F	● 115 F	● 115 F	● 115 F	● 115 F	● 115 F	SPECIFIC	GROWTH
S		CAT.	MWc	SGv	Pv,115	Pt,115	Vv,115	Va,115	Wa,115	Wv-a,115	Wv-a,115/	GRAVITY	RATE
		(1)	(13)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	Wa,115	(9)
						(15)	(PSIA)			(LBm/	(LBm/		
						(PSIA)	(PSIA)			FT^3)	FT^3)		

*** *****													

46 CFR SUBCHAPTER D, BUT NOT TABLE 30.25-1													

AROMATIC RESIN OIL 60	ARS	1.02	1		1.00	0.15	16.200	0.009	0.991	0.076	0.076	1.000	1.003
AROMATIC RESIN OIL 80	ARS	1.02	1		1.00	0.15	16.200	0.009	0.991	0.076	0.076	1.000	1.003
AROMATIC RESIN OILS			8										

E-2-5

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE III: MAX PRESSURE @ REMOTE TANK FOR
"VGR" * MAX ALLOWABLE LIQUID TRANSFER RATE

CARGO	C H R I S	MAX VAPOR-				PIPE SECT I: LOSS		PIPE SECT II: LOSS		PRESS			
		LIQUID	AIR	REQUIRED AIR	PRESS	FM REMOTE TK TO PV		FM REMOTE TK TO PV		THRU	PRESS	IS	
		TRANSF	MIX	EQUIVALENT	ACROSS	TOTAL		TOTAL		REMOTE	REMOTE	Ptk <	
		(MLTR)	RATE	-----	PV	LOSS		LOSS		TANK	TANK	MDWP	
		Q1	Qv-a	Qa	VALVE	HtotI		HtotII		* Htot	Ploss	Ptk	
		(10)	(11)	(12)	PV	(FT)		(FT)		(PSI)	(PSI)	(PSI)	
		(BBL/ HR)	(BBL/ HR)	(BBL/ HR)	(FT^3/ HR)	(PSI)		(PSI)		(PSI)	(PSI)	(PSI)	
46 CFR SUBCHAPT O, TABLE 151	***												
ACETIC ACID	AAC	5,000	5092	5244	29446	1.635	*****	88.7	*****	0.0	88.7	0.050	1.68 OK
ACETIC ANHYDRIDE	ACA	5,000	5040	5193	29158	1.635	*****	87.0	*****	0.0	87.0	0.049	1.68 OK
ACETONITRILE	ATN	5,000	5003	5005	28101	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68 OK
ACRYLIC ACID	ACR	5,000	5040	5131	28810	1.635	*****	87.1	*****	0.0	87.1	0.048	1.68 OK
ACRYLONITRILE	ACN	5,000	5500	6142	34483	1.665	*****	102.3	*****	0.0	102.3	0.067	1.73 OK
ADIPONITRILE	ADN	5,000	5001	5005	28103	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68 OK
ALUMINUM SULFATE SOLUTION	ASX												
AMINOETHYLETHANOLAMINE	AEE	5,000	5001	5005	28101	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68 OK
AMMONIUM BISULFITE SOLN (70% OR LESS)	ABX												
AMMONIUM HYDROXIDE (28% OR LESS NH3)	AMH												
ANTHRACENE OIL (COAL TAR FRACTION)	AHO												
BENZENE	BNZ	5,000	6250	7655	42978	1.725	*****	130.3	*****	0.0	130.3	0.103	1.83 OK
BENZENE HYDROCARBON MIXTURES (W/ACETYLENES) (W/10% BENZENE OR MORE)	BHB	5,000	5730	7711	43296	1.725	*****	108.9	*****	0.0	108.9	0.104	1.83 OK
BENZENE HYDROCARBON MIXTURES (W/10% BENZENE OR MORE)	BHB	5,000	5730	7711	43296	1.725	*****	108.9	*****	0.0	108.9	0.104	1.83 OK
BENZENE, TOLUENE, XYLENE MIXTURES (HAVING 10% BENZENE OR MORE)	BTX	5,000	5730	7711	43296	1.725	*****	108.9	*****	0.0	108.9	0.104	1.83 OK
iso-BUTYL ACRYLATE	BAI	5,000	5060	5371	30156	1.665	*****	87.4	*****	0.0	87.4	0.052	1.72 OK
n-BUTYL ACRYLATE	BTC	5,000	5040	5247	29462	1.635	*****	86.9	*****	0.0	86.9	0.050	1.68 OK
BUTYL ACRYLATE (SEE ISO- & N- BUTYL ACRYLATE)	BAR	5,000	5060	5371	30156	1.665	*****	87.4	*****	0.0	87.4	0.052	1.72 OK
BUTYL METHACRYLATE	BMH	5,000	5029	5202	29205	1.635	*****	86.6	*****	0.0	86.6	0.049	1.68 OK
iso-BUTYRALDEHYDE	BAD	5,000	5780	7585	42589	1.725	*****	111.1	*****	0.0	111.1	0.101	1.83 OK
n-BUTYRALDEHYDE	BTR	5,000	5780	7585	42589	1.725	*****	111.1	*****	0.0	111.1	0.101	1.83 OK
BUTYRALDEHYDES (CRUDE)	BFA	5,000	5800	7631	42843	1.725	*****	111.9	*****	0.0	111.9	0.102	1.83 OK
BUTYRALDEHYDE (ISO-, N-)	BAE	5,000	5800	7631	42843	1.725	*****	111.9	*****	0.0	111.9	0.102	1.83 OK
CAMPOR OIL (LIGHT)	CPO												
CARBON TETRACHLORIDE	CBT												
CAUSTIC POTASH SOLUTION	CPS												
CAUSTIC SODA SOLUTION	CSS												
CHLOROBENZENE	CRB	5,000	5080	5429	30483	1.665	*****	88.1	*****	0.0	88.1	0.053	1.72 OK
CHLOROFORM	CRF												
CHLOROSULFONIC ACID	CSA												
COAL TAR NAPHTHA SOLVENT	NCT	5,000	5020	5102	28645	1.635	*****	86.4	*****	0.0	86.4	0.047	1.68 OK
CREOSOTE (COAL TAR)	CCT	5,000	5001	5005	28103	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68 OK
CREOSOTE (WOOD)	CWD	5,000	5001	5005	28103	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68 OK
CRESOLS (ALL ISOMERS)	CRS	5,000	5006	5031	28248	1.635	*****	86.1	*****	0.0	86.1	0.046	1.68 OK
CRESOLS WITH LESS THAN 5% PHENOL (SEE CRESOLS (ALL ISOMERS))	CRS												
CRESOLS WITH 5% OR MORE PHENOL (SEE PHENOL)	CFP	5,000	5005	5026	28219	1.635	*****	86.1	*****	0.0	86.1	0.046	1.68 OK
CRESYLATE SPENT CAUSTIC	CSC												
CRESYLIC ACID, SODIUM SALT SOLUTION, SEE CRESYLATE SPENT CAUSTIC	CAX												
CROTONALDEHYDE	CTA	5,000	5200	5635	31636	1.665	*****	92.3	*****	0.0	92.3	0.057	1.72 OK

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE III: MAX PRESSURE @ REMOTE TANK FOR
"VGR" * MAX ALLOWABLE LIQUID TRANSFER RATE

CARGO	C	MAX	VAPOR-				PIPE SECT I: LOSS	PIPE SECT II: LOSS				PIP'G	PRESS	IS	
		LIQUID	AIR	REQUIRED AIR	PRESS	FM REMOTE	TK TO PV	FM REMOTE	TK TO PV	REMOTE	●	TANK	TANK		Ptk <
		TRANSF	MIX												
		R	FLOW	EQUIVALENT	ACROSS										
		I	(ML/TR)	RATE	PV	LOSS	LOSS	TOTAL	TOTAL	GRAND	TO P/V				
S	Q1	Qv-a	Qa	VALVE											
	(10)	(11)	(12)	PV											
	(BBL/	(BBL/	(BBL/	(FT^3/											
	HR)	HR)	HR)	HR)	(PSI)										
CYCLOHEXANONE	CCH	5,000	5002	5009	28126	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK	
CYCLOHEXYLAMINE	CHA	5,000	5062	5291	29709	1.635	*****	87.6	*****	0.0	87.6	0.051	1.69	OK	
DECYL ACRYLATE (iso-, n-)	DAT	5,000	5001	5011	28134	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK	
DICHLOROBENZENE (ALL ISOMERS)	DBX	5,000	5010	5073	28481	1.635	*****	86.1	*****	0.0	86.1	0.047	1.68	OK	
1,1-DICHLOROETHANE	DCH	5,000	5990	9419	52886	1.785	*****	117.3	*****	0.0	117.3	0.153	1.94	OK	
2,2-DICHLOROETHYL ETHER	DEE	5,000	5004	5028	28231	1.635	*****	86.1	*****	0.0	86.1	0.046	1.68	OK	
DICHLOROMETHANE (ALSO KNOWN AS METHYLENE CHLORIDE)	DCM														
2,4-DICHLOROPHENOXYACETIC ACID DIETHANOLAMINE SALT SOLUTION	DDE														
2,4-DICHLOROPHENOXYACETIC ACID, DIMETHYLAMINE SALT SOLUTION	DAD														
2,4-DICHLOROPHENOXYACETIC ACID, TRIISOPROPANOLAMINE SALT SOLUTION	DDT														
1,1-,1,2- OR 1,3- DICHLOROPROPANE	DPX	5,000	5630	8213	46110	1.755	*****	104.5	*****	0.0	104.5	0.118	1.87	OK	
1,3-DICHLOROPROPENE	DPU	5,000	5550	7778	43673	1.725	*****	102.0	*****	0.0	102.0	0.106	1.83	OK	
DICHLOROPROPENE, DICHLOROPROPANE MIXTURES	DMX	5,000	5630	8213	46110	1.755	*****	104.5	*****	0.0	104.5	0.118	1.87	OK	
2,2-DICHLOROPROPIONIC ACID	DCN														
DIETHANOLAMINE	DEA	5,000	5001	5005	28102	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK	
DIETHYLAMINE	DEN	5,000	5100	5331	29931	1.635	*****	88.9	*****	0.0	88.9	0.051	1.69	OK	
DIETHYLENETRIAMINE	DET	5,000	5004	5019	28182	1.635	*****	86.1	*****	0.0	86.1	0.046	1.68	OK	
DIETHYL ETHER, SEE ETHYL ETHER	DEH														
DIISOBUTYLAMINE	DBU	5,000	5046	5288	29691	1.635	*****	87.0	*****	0.0	87.0	0.051	1.69	OK	
DIISOPROPANOLAMINE	DIP	5,000	5001	5007	28110	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK	
DIISOPROPYLAMINE	DIA	5,000	5370	6731	37791	1.695	*****	96.8	*****	0.0	96.8	0.080	1.78	OK	
N,N-DIMETHYLACETAMIDE	DAC	5,000	5020	5082	28532	1.635	*****	86.5	*****	0.0	86.5	0.047	1.68	OK	
DIMETHYLETHANOLAMINE	DMB	5,000	5050	5206	29229	1.635	*****	87.3	*****	0.0	87.3	0.049	1.68	OK	
DIMETHYLFORMAMIDE	DMF	5,000	5030	5100	28634	1.635	*****	86.8	*****	0.0	86.8	0.047	1.68	OK	
1,4-DIOXANE	DOK	5,000	5184	5751	32288	1.665	*****	91.3	*****	0.0	91.3	0.059	1.72	OK	
DI-N-PROPYLAMINE	DNA	5,000	5150	5715	32088	1.665	*****	90.1	*****	0.0	90.1	0.059	1.72	OK	
ETHANOLAMINE	MEA	5,000	5003	5008	28119	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK	
ETHYL ACRYLATE	EAC	5,000	5200	5949	33399	1.665	*****	91.4	*****	0.0	91.4	0.063	1.73	OK	
ETHYLAMINE SOLUTION (72% OR LESS)	EAN	5,000	6550	8117	45576	1.755	*****	142.7	*****	0.0	142.7	0.116	1.87	OK	
N-ETHYLBUTYLAMINE	EBA	5,000	5120	5574	31296	1.665	*****	89.5	*****	0.0	89.5	0.056	1.72	OK	
N-ETHYLCYCLOHEXYLAMINE	ECC	5,000	5050	5308	29805	1.635	*****	87.1	*****	0.0	87.1	0.051	1.69	OK	
ETHYLENE CYANOHYDRIN	ETC	5,000	5001	5003	28092	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK	
ETHYLENEDIAMINE	EDA	5,000	5090	5243	29439	1.635	*****	88.7	*****	0.0	88.7	0.050	1.68	OK	
ETHYLENE DIBROMIDE	EDB														
ETHYLENE DICHLORIDE	EDC	5,000	5400	6825	38322	1.695	*****	97.5	*****	0.0	97.5	0.082	1.78	OK	
ETHYLENE GLYCOL PROPYL ETHER	EGP	5,000	5060	5404	30344	1.665	*****	87.4	*****	0.0	87.4	0.053	1.72	OK	
2-ETHYLHEXYL ACRYLATE	EAI	5,000	5002	5019	28177	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK	
ETHYLIDENE NORBORNENE	ENB	5,000	5033	5190	29137	1.635	*****	86.7	*****	0.0	86.7	0.049	1.68	OK	
ETHYL METHACRYLATE	ETM	5,000	5100	5544	31125	1.665	*****	88.8	*****	0.0	88.8	0.055	1.72	OK	
2-ETHYL-3-PROPYLACROLEIN	EPA	5,000	5012	5074	28488	1.635	*****	86.2	*****	0.0	86.2	0.047	1.68	OK	
FERRIC CHLORIDE SOLUTIONS	FCS														
FORMALDEHYDE SOLUTION (37% TO 50%)	FMS	5,000	5015	5016	28162	1.635	*****	86.4	*****	0.0	86.4	0.046	1.68	OK	

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

CARGO		C H R I S	MAX	VAPOR-				PIPE SECT I: LOSS	PIPE SECT II: LOSS	PIP'G PRESS		IS		
			LIQUID	AIR		FM REMOTE	TK TO PV	FM REMOTE	TK TO PV	REMOTE	•			
			TRANSF	MIX	REQUIRED	ACROSS	TOTAL	TOTAL	GRAND	TANK	REMOTE			
			RATE	FLOW	EQUIVALENT		LOSS	LOSS	TOTAL	TO P/V	TANK			
			(MLTR)	RATE	-----	PV	LOSS	LOSS	LOSS	Wv-a,11	PV +		Ptk <	
	Q1	Qv-a	Qa	VALVE								MDWP		
	(10)	(11)	(12)	FV			HtotI	HtotII	Htot=	* Htot	Ploss	Ptk		
	(BBL/ HR)	(BBL/ HR)	(BBL/ HR)	(FT^3/ HR)	(PSI)		(FT)	(FT)	(FT)	(PSI)	(PSI)			
FORMIC ACID	FMA	5,000	5210	5409	30369	1.665	*****	92.7	*****	0.0	92.7	0.053	1.72	OK
FURFURAL	FFA	5,000	5015	5068	28457	1.635	*****	86.3	*****	0.0	86.3	0.047	1.68	OK
GLUTARALDEHYDE SOLUTION (50% OR LESS)	GTA													
HEXAMETHYLENEDIAMINE SOLUTION	HMC	5,000	5001	5006	28105	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
HEXAMETHYLENEIMINE	HMI	5,000	5050	5050	28354	1.635	*****	87.6	*****	0.0	87.6	0.046	1.68	OK
HYDROCHLORIC ACID SPENT (15% OR LESS)	HCS													
ISOPENTALDEHYDE (MIXED ISOMERS) (SEE VALERALDEHYDE (ISO-, N-))														
ISOPRENE	IPR	5,000	7300	12467	69999	1.890	*****	172.3	*****	0.0	172.3	0.266	2.16	OK
KRAFT PULPING LIQUORS (FREE ALKALI CONTENT 3% OR MORE) (INCLUDING:	KPL													
MESITYL OXIDE	MSO	5,000	5067	5323	29884	1.635	*****	87.7	*****	0.0	87.7	0.051	1.69	OK
METHYL ACRYLATE	MAM	5,000	5410	6640	37279	1.695	*****	98.2	*****	0.0	98.2	0.078	1.77	OK
METHYLCYCLOPENTADIENE DIMER	MCK	5,000	5015	5013	28148	1.635	*****	86.4	*****	0.0	86.4	0.046	1.68	OK
METHYL DIETHANOLAMINE	MDE	5,000	5010	5058	28397	1.635	*****	86.2	*****	0.0	86.2	0.046	1.68	OK
2-METHYL-5-ETHYLPYRIDINE	MEP	5,000	5016	5094	28602	1.635	*****	86.4	*****	0.0	86.4	0.047	1.68	OK
METHYLENE CHLORIDE (SEE DICHLOROMETHANE)														
METHYL METHACRYLATE	MMM	5,000	5202	5944	33372	1.665	*****	91.5	*****	0.0	91.5	0.063	1.73	OK
2-METHYLPYRIDINE	MPR	5,000	5050	5219	29301	1.635	*****	87.3	*****	0.0	87.3	0.049	1.68	OK
alpha-METHYLSTYRENE	MSR	5,000	5040	5228	29354	1.635	*****	86.9	*****	0.0	86.9	0.049	1.68	OK
MORPHOLINE	MPL	5,000	5080	5325	29898	1.635	*****	88.2	*****	0.0	88.2	0.051	1.69	OK
NITRIC ACID (70% OR LESS)	NCD													
NITROPROPANE (-1, OR -2)	NPM	5,000	5105	5435	30516	1.665	*****	89.0	*****	0.0	89.0	0.053	1.72	OK
OCTYL NITRATES (ALL ISOMERS)	ONE	5,000	5031	5266	29568	1.635	*****	86.6	*****	0.0	86.6	0.050	1.69	OK
OLEUM	OLM	5,000	5001	5004	28094	1.635	*****	86.0	*****	0.0	86.0	0.045	1.68	OK
PENTACHLOROETHANE	PCE													
1, 3-PENTADIENE	PDE	5,000	6706	10458	58720	1.815	*****	146.7	*****	0.0	146.7	0.189	2.00	OK
PERCHLOROETHYLENE (SAME AS TETRACHLOROETHYLENE)	PER													
PHOSPHORIC ACID	PAC													
POLYETHYLENE POLYAMINES	PEB	5,000	5001	5007	28114	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
POLYMETHYLENE POLYPHENYL ISOCYANATE	PPI													
POTASSIUM HYDROXIDE SOLUTION (SEE CAUSTIC POTASH SOLUTION)														
iso-PROPANOLAMINE	MPA	5,000	5008	5028	28228	1.635	*****	86.2	*****	0.0	86.2	0.046	1.68	OK
PROPANOLAMINE (iso-, n-)	PAX	5,000	5008	5028	28228	1.635	*****	86.2	*****	0.0	86.2	0.046	1.68	OK
PROPIONIC ACID	PNA	5,000	5030	5102	28647	1.635	*****	86.8	*****	0.0	86.8	0.047	1.68	OK
iso-PROPYLAMINE	IPP	5,000	7342	11619	65233	1.890	*****	175.0	*****	0.0	175.0	0.232	2.12	OK
iso-PROPYL ETHER	IPE	5,000	5664	8060	45251	1.755	*****	106.0	*****	0.0	106.0	0.113	1.87	OK
PYRIDINE	PRD	5,000	5130	5473	30727	1.665	*****	89.8	*****	0.0	89.8	0.054	1.72	OK
SODIUM ALUMINATE SOLUTION	SAU													
SODIUM CHLORATE SOLUTION (50% OR LESS)	SDD													
SODIUM DICHROMATE SOL'N (70% OR LESS)	SDL													
SODIUM HYDROXIDE SOLUTION (SEE CAUSTIC SODA SOLUTION)														
SODIUM HYPOCHLORITE SOL'N (15% OR LESS)	SHP													
SODIUM SULFIDE, HYDROSULFIDE SOLUTIONS (H2S 15 PPM OR LESS)	SSH													

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE III: MAX PRESSURE @ REMOTE TANK FOR
"VGR" * MAX ALLOWABLE LIQUID TRANSFER RATE

CARGO	C	MAX	VAPOR-	PIPE SECT I: LOSS				PIPE SECT II: LOSS				THRU	PRESS	IS	
		LIQUID	AIR	FM REMOTE TK TO PV		FM REMOTE TK TO PV		FM REMOTE TK TO PV		PIP'G	•				
		TRANSF	MIX	REQUIRED AIR		ACROSS		TOTAL		TOTAL		GRAND	TO P/V		REMO
		R	FLOW	EQUIVALENT		PV		LOSS		LOSS		TOTAL	TANK		TANK
		I	(MLTR)	Qv-a	Qa	VALVE	HtotI	HtotII	Htot=	I+II	Ploss	Ptk	MDWP		
S	Q1	Qv-a	Qa	PV											
		(10)	(11)	(12)											
		(BBL/	(BBL/	(BBL/	(FT^3/										
		HR)	HR)	HR)	HR)	(PSI)	(FT)	(FT)	(FT)	(PSI)	(PSI)				
SODIUM SULFIDE HYDROSULFIDE SOLUTIONS (15 PPM<H2S<200 PPM)	SSI														
SODIUM SULFIDE HYDROSULFIDE SOLUTIONS (H2S GREATER THAN 200 PPM)	SSJ														
SODIUM THIOCYANATE SOLUTION (56% OR LESS)	STS														
STYRENE MONOMER	STY	5,000	5040	5199	29191	1.635	*****	87.0	*****	0.0	87.0	0.049	1.68	OK	
SULFURIC ACID	SFA	5,000	5001	5005	28100	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK	
SULFURIC ACID, SPENT	SAC	5,000	5001	5000	28070	1.635	*****	86.0	*****	0.0	86.0	0.045	1.68	OK	
1,1,2,2-TETRACHLOROETHANE (ACETYLENE TETRACHLORIDE)	TEC														
TETRAETHYLENEPENTAMINE	TTP	5,000	5000	5001	28079	1.635	*****	86.0	*****	0.0	86.0	0.045	1.68	OK	
TETRAHYDROFURAN	THF	5,000	5850	6365	35735	1.695	*****	115.7	*****	0.0	115.7	0.072	1.77	OK	
1,1,2-TRICHLOROETHANE (VINYL TRICHLORIDE)	TCM	5,000	5102	5651	31727	1.665	*****	88.4	*****	0.0	88.4	0.057	1.72	OK	
TRICHLOROETHANE (SEE 1,1,2-TRICHLOROETHANE)															
TRICHLOROETHYLENE	TCL	5,000	5346	7067	39679	1.695	*****	95.3	*****	0.0	95.3	0.088	1.78	OK	
1,2,3-TRICHLOROPROPANE	TCN	5,000	5015	5121	28751	1.635	*****	86.3	*****	0.0	86.3	0.048	1.68	OK	
TRIETHANOLAMINE	TEA	5,000	5001	5007	28115	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK	
TRIETHYLAMINE	TEN	5,000	5250	6177	34681	1.665	*****	93.2	*****	0.0	93.2	0.068	1.73	OK	
TRIETHYLENETETRAMINE	TET	5,000	5001	5007	28114	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK	
UREA, AMMONIUM NITRATE SOL'N (CONTAINING MORE THAN 2% NH3)	UAS														
VALERALDEHYDE (iso-, n-)		5,000	5500	6995	39272	1.695	*****	101.2	*****	0.0	101.2	0.087	1.78	OK	
VALERALDEHYDE (iso-)	IVA	5,000	5500	6995	39272	1.695	*****	101.2	*****	0.0	101.2	0.087	1.78	OK	
VALERALDEHYDE (n-)	VAL	5,000	5001	5009	28122	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK	
VANILLAN BLACK LIQUOR (FREE ALKALI CONTENT 3% OR MORE)	VBL														
VINYL ACETATE	VAM	5,000	5580	7287	40913	1.725	*****	103.8	*****	0.0	103.8	0.094	1.82	OK	
VINYLTOLUENE	VNT	5,000	5012	5069	28460	1.635	*****	86.2	*****	0.0	86.2	0.047	1.68	OK	

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE III: MAX PRESSURE @ REMOTE TANK FOR
"VGR" * MAX ALLOWABLE LIQUID TRANSFER RATE

CARGO	C	MAX	VAPOR-				PIPE SECT I: LOSS	PIPE SECT II: LOSS			PIP'G	PRESS	IS	
		LIQUID	AIR	REQUIRED AIR	FM REMOTE TK TO PV	FM REMOTE TK TO PV	REMOTE	REMO	GRAND	TO P/V	TANK	TANK		
		TRANSF	MIX	EQUIVALENT	ACROSS	LOSS	LOSS	LOSS						LOSS
		RATE	FLOW		PV	LOSS	LOSS	LOSS						LOSS
		I	(MLTR)	RATE		PV	LOSS	LOSS						LOSS
S	Q1	Qv-a	Qa	VALVE	HtotI	HtotII	Htot=	I+II	* Htot	Ploss	Ptk	MDWP		
	(10)	(11)	(12)	PV										
	(BBL/	(BBL/	(BBL/	(FT^3/										
	HR)	HR)	HR)	HR)	(PSI)	(FT)	(FT)	(FT)	(PSI)	(PSI)				

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=====														
1,1-DICHLOROPROPANE	DPB	5,000	5630	8213	46110	1.755	*****	104.5	*****	0.0	104.5	0.118	1.87	OK
1,1,1-TRICHLOROETHANE														
1,2-DICHLOROPROPANE	DPP	5,000	5260	6227	34960	1.665	*****	93.2	*****	0.0	93.2	0.069	1.73	OK
1,3-CYCLOPENTADIENE														
1,3-DICHLOROPROPANE	DPC	5,000	5380	6974	39156	1.695	*****	96.5	*****	0.0	96.5	0.086	1.78	OK
2-METHYL-2-HYDROXY-3-BUTYNE	MHB	5,000	5114	5445	30573	1.665	*****	89.3	*****	0.0	89.3	0.054	1.72	OK
2,4-DICHLOROPHENOXYACETIC ACID, DIMETHYLAMINE SALT SOLUTION (70%)	DDA													
3-PENTENENITRILE	PNT													
AEROTHENE TT (1,1,1-TRICHLOROETHANE)														
ALKYLBENZENE														
AMINOETHYLPIPERAZINE	AEP													
BENZENE RAFFINATE (ASSUME VAPOR PROPERTIES SIMILAR TO BENZENE)		5,000	6250	7655	42978	1.725	*****	130.3	*****	0.0	130.3	0.103	1.83	OK
BENZENE SULFONYL CHLORIDE	BSC	5,000	5000	5001	28078	1.635	*****	86.0	*****	0.0	86.0	0.045	1.68	OK
BENZYL ACETATE	BZE	5,000	5002	5015	28157	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
BENZYL CHLORIDE (STABILIZED)	BCL	5,000	5009	5056	28385	1.635	*****	86.2	*****	0.0	86.2	0.046	1.68	OK
BUTANOL														
BUTYL ETHER (n-)	BTE	5,000	5040	5253	29495	1.635	*****	86.9	*****	0.0	86.9	0.050	1.68	OK
BUTYLENE OXIDE (1,2-)	BTO	5,000	5918	8037	45125	1.755	*****	115.9	*****	0.0	115.9	0.113	1.87	OK
BUTYRIC ACID	BRA	5,000	5007	5029	28234	1.635	*****	86.2	*****	0.0	86.2	0.046	1.68	OK
CARBOLIC ACID	CBO	5,000	5006	5027	28224	1.635	*****	86.1	*****	0.0	86.1	0.046	1.68	OK
CHLOROACETIC ACID (80% OR LESS)	CHM	5,000	5001	5005	28099	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
CHLOROPROPIONIC ACID (2- OR 3-)	CPM	5,000	5002	5010	28131	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
CHLOROTOLUENE (m-)	CTM	5,000	5032	5198	29186	1.635	*****	86.7	*****	0.0	86.7	0.049	1.68	OK
CHLOROTOLUENE (o-)	CTO	5,000	5032	5198	29186	1.635	*****	86.7	*****	0.0	86.7	0.049	1.68	OK
CHLOROTOLUENE (p)	CRN	5,000	5009	5056	28385	1.635	*****	86.2	*****	0.0	86.2	0.046	1.68	OK
CHLOROTOLUENES (MIXED ISOMERS)	CHI	5,000	5053	5327	29907	1.635	*****	87.2	*****	0.0	87.2	0.051	1.69	OK
CREOSOTE (ALL ISOMERS)	CCW	5,000	5001	5005	28103	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
CRESYLIC ACID TAR	CRX	5,000	5010	5010	28130	1.635	*****	86.3	*****	0.0	86.3	0.046	1.68	OK
CYCLOHEPTANE	CYE	5,000	5140	5646	31700	1.665	*****	89.7	*****	0.0	89.7	0.057	1.72	OK
CYCLOHEXANONE, CYCLOHEXANOL MIXTURE	CYX	5,000	5100	5462	30666	1.665	*****	88.8	*****	0.0	88.8	0.054	1.72	OK
CYCLOHEXYL ACETATE	CYC	5,000	5001	5007	28113	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
CYCLOPENTADIENE, STYRENE, BENZENE MIXTURE	CSB	5,000	5450	7681	43124	1.725	*****	98.3	*****	0.0	98.3	0.103	1.83	OK
CYCLOPENTANE	CYP	5,000	6315	9230	51825	1.785	*****	131.0	*****	0.0	131.0	0.148	1.93	OK
DECANOIC ACID	DCO													
DI 2 ETHYLHEXYL PHTHALATE (SEE ALSO ETHYLHEXYL PHTHALATE)														
DICHLOROISOPROPYL ETHER (2,2'-)	DCI	5,000	5006	5051	28361	1.635	*****	86.1	*****	0.0	86.1	0.046	1.68	OK
DICHLOROPROPANE														
DICHLOROPROPENE														
DIETHYL SULFATE	DSU	5,000	5001	5008	28116	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE III: MAX PRESSURE @ REMOTE TANK FOR "VGR" * MAX ALLOWABLE LIQUID TRANSFER RATE						PRESS DROP THRU PIP'G REMOTE TANK REMOTE PRESS TO P/V TANK Ploss Ptk			IS Ptk < MDNP					
CARGO	C H R I S	MAX	VAPOR-			PIPE SECT I: LOSS	PIPE SECT II: LOSS	GRAND TOTAL LOSS Htot= I+II (FT)	TO P/V Wv-a,11 * Htot Ploss (PSI)	PV + Ptk (PSI)				
		LIQUID	AIR	REQUIRED AIR	PRESS	FM REMOTE TK TO PV	FM REMOTE TK TO PV							
		TRANSF	MIX	EQUIVALENT	ACROSS	TOTAL	TOTAL							
		RATE	FLOW		PV	LOSS	LOSS							
(MLTR)	RATE	Qa	VALVE	HtotI	HtotII									
(10)	(11)	(12)	PV											
(BBL/ HR)	(BBL/ HR)	(BBL/ HR)	(FT^3/ HR)	(PSI)	(FT)	(FT)								
DIETHYLETHANOLAMINE	DAE	5,000	5018	5102	28645	1.635	*****	86.4	*****	0.0	86.4	0.047	1.68	OK
DODECYL BENZENE														
DODECYLDIMETHYLAMINE TETRADECYLDIMETHYLAMINE MIXTURE	DOT													
DRIPOLENE														
ETHANOL (see ethyl alcohol)														
ETHYL BROMIDE														
ETHYL TERT-BUTYL ETHER	EBE	5,000	5500	7321	41103	1.725	*****	100.6	*****	0.0	100.6	0.094	1.82	OK
ETHYLAMINE	EAM	5,000	9080	14023	78736	1.975	*****	266.3	*****	0.0	266.3	0.336	2.31	OK
ETHYLENE DICHLORIDE 1,1,2-TRICHLOROETHANE MIXTURE	ETX	5,000	5370	7249	40700	1.725	*****	95.9	*****	0.0	95.9	0.092	1.82	OK
ETHYLMERCAPTAN (SAME AS ETHANETHIOL)														
ETHYLPHENOL	EPL	5,000	5002	5012	28140	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
FORMALDEHYDE SOLUTION (50% OR MORE), METHANOL MIXTURES	MTM	5,000	5663	5778	32440	1.665	*****	109.5	*****	0.0	109.5	0.060	1.73	OK
HYDROSULFIDE														
INDENES														
ISOBUTYL ACETATE	IBA	5,000	5036	5204	29218	1.635	*****	86.8	*****	0.0	86.8	0.049	1.68	OK
ISOPRENE, PENTADIENE MIXTURE	IPN													
ISO-PROPYL ALCOHOL		5,000	5300	5803	32584	1.665	*****	95.4	*****	0.0	95.4	0.060	1.73	OK
LAURIC ACID	LRA													
METHACRYLONITRILE	MET	5,000	5339	6027	33837	1.665	*****	96.4	*****	0.0	96.4	0.065	1.73	OK
METHANOL														
METHYL STYRENE														
METHYL STYRENE, INDENES, ALKYL BENZENE MIXTURES	MIA													
METHYLCYCLOHEXANE	MCY	5,000	5237	6087	34178	1.665	*****	92.7	*****	0.0	92.7	0.066	1.73	OK
METHYLHEXANE (SAME AS HEPTANE)														
MONOETHANOLAMINE	MEA	5,000	5010	5027	28226	1.635	*****	86.3	*****	0.0	86.3	0.046	1.68	OK
MONOISOPROPANOLAMINE		5,000	5020	5069	28461	1.635	*****	86.5	*****	0.0	86.5	0.047	1.68	OK
NAPHTHALENE (MOLTEN)	NTM	5,000	5001	5006	28109	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
NEODECANOIC ACID	NEA	5,000	5001	5009	28122	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
NITRILOTRIACETIC ACID	NAA													
NITROPHENOL (MOLTEN)	NTP													
NITROPROPANE (60%), NITROETHANE (40%) MIXTURE	NNM	5,000	5110	5456	30632	1.665	*****	89.1	*****	0.0	89.1	0.054	1.72	OK
NITROTOLUENE (o-,p-)	NIT	5,000	5002	5014	28149	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
PARALDEHYDE	PDH	5,000	5830	9788	54958	1.785	*****	110.7	*****	0.0	110.7	0.165	1.95	OK
POLYGLYCERINE, SODIUM SALT SOLN (CONTAINING 3% OR MORE SODIUM HYDPOGS	PAD	5,000	6376	8671	48684	1.755	*****	134.3	*****	0.0	134.3	0.131	1.89	OK
PROPIONALDEHYDE	PAH	5,000	5011	5070	28467	1.635	*****	86.2	*****	0.0	86.2	0.047	1.68	OK
PROPIONIC ANHYDRIDE	PCN	5,000	5117	5281	29649	1.635	*****	89.6	*****	0.0	89.6	0.050	1.69	OK
PROPIONITRILE	PRA	5,000	6355	8690	48792	1.755	*****	133.1	*****	0.0	133.1	0.132	1.89	OK
PROPYLAMINE (n-)		5,000	5414	4829	27113	1.635	*****	101.7	*****	0.0	101.7	0.043	1.68	OK
PROPYLBENZENE	GPY	5,000	5730	7711	43296	1.725	*****	108.9	*****	0.0	108.9	0.104	1.83	OK
PYROLYSIS GASOLINE (GREATER THAN 5% BENZENE)														
PYROLYSIS RESIDUAL FUELS														
SEWAGE, RAW	SWR													

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

CARGO

TABLE III: MAX PRESSURE @ REMOTE TANK FOR "VGR" * MAX ALLOWABLE LIQUID TRANSFER RATE													PRESS DROP THRU PIP'G PRESS ● TANK REMOTE	IS
C	MAX LIQUID TRANSF RATE (MLTR)	VAPOR- AIR MIX FLOW RATE Qv-a (11) (BBL/ HR)	REQUIRED AIR EQUIVALENT Qa (12) (BBL/ HR)	PRESS ACROSS PV VALVE PV (PSI)	PIPE SECT I: LOSS FM REMOTE TK TO PV	PIPE SECT II: LOSS FM REMOTE TK TO PV	TOTAL LOSS HtotI (FT)	TOTAL LOSS HtotII (FT)	GRAND TOTAL LOSS Htot= I+II (FT)	TO P/V Wv-a,11 * Htot Ploss (PSI)	TANK PV + Ploss Ptk (PSI)	MDWP		
H	R	I	S											
SODIUM SULFIDE (SOLID IN WATER)	SDS													
STYRENE	STY 5,000	5040	5199	29192	1.635	*****	87.0	*****	0.0	87.0	0.049	1.68	OK	
STYRENE CRUDE	STX 5,000	5040	5199	29192	1.635	*****	87.0	*****	0.0	87.0	0.049	1.68	OK	
STYRENE TAR	STT													
TETRAMETHYLBENZENE (1,2,3,5-)	TTB 5,000	5014	5083	28539	1.635	*****	86.3	*****	0.0	86.3	0.047	1.68	OK	
TOLUIDINE (o-)	TLI 5,000	5001	5005	28102	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK	
TRICHLOROBENZENE (1,2,4-)	TCB 5,000	5003	5027	28226	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK	
TRIIISOPROPANOLAMINE SALT OF 2,4-DICHLOROPHENOXY ACETIC ACID SOL'N	TPE													
TRIPHENYLBORANE	UDA													
UNDECANOIC ACID	UDN													
HYDROCARBON 5-9	HPN 5,000	5440	6992	39256	1.695	*****	99.0	*****	0.0	99.0	0.086	1.78	OK	

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE III: MAX PRESSURE @ REMOTE TANK FOR
"VGR" * MAX ALLOWABLE LIQUID TRANSFER RATE

CARGO	C H R I S	MAX VAPOR-				PIPE SECT I: LOSS				PIPE SECT II: LOSS				PRESS DROP THRU PIP'G PRESS @ TANK REMOTE		
		LIQUID	AIR	REQUIRED	PRESS	FM	TK	TO	PV	FM	TK	TO	PV	TO	P/V	TANK
		TRANSF	MIX	EQUIVALENT	ACROSS	TOTAL				TOTAL				GRAND	WV-a,11	PV +
		RATE	FLOW		PV	LOSS				LOSS				TOTAL	* Htot	Ploss
		(MLTR)	RATE		VALVE	HtotI				HtotII				LOSS	I+II	Ptk
		Q1	Qv-a	Qa	PV											
		(10)	(11)	(12)												
		(BBL/ HR)	(BBL/ HR)	(BBL/ HR)	(FT^3/ HR)	(PSI)		(FT)		(FT)		(FT)		(FT)	(PSI)	(PSI)

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Acetone	ACT	5,000	6000	7630	42842	1.725	*****	119.7	*****	0.0	119.7	0.102	1.83	OK		
Acetophenone	ACP	5,000	5060	5346	30017	1.665	*****	87.4	*****	0.0	87.4	0.052	1.72	OK		
Acetyl Tributyl Citrate																
Acrylonitrile-Styrene Copolymer dispersion in Polyether Polyol	ALE															
Alcohols (C13 and above)	ALY															
Alcoholic beverages, N.O.S.																
Alcohol (C6 - C17) (secondary) Poly(3-6)ethoxylates																
Alcohol (C12 - C15) Poly(1-3)ethoxylates																
Alcohol (C12 - C15) Poly(3-11)ethoxylates																
Alkenylsuccinic acid																
Alkenylsuccinic Anhydride																
Alkyl (C9 - C17) Benzenes	AKB															
Alkylbenzenesulfonic acid (4% or less)	ABS															
Alkyl Phthalates (n-)																
Alkyl Succinate Formaldehyde Hydr- oxyamino condensate (3.2% or less)																
Aminoethyldiethanolamine, Aminoethylethanolamine solution																
Amyl Acetate (commercial, iso-, n-, sec-)	AEC	5,000	5202	6235	35005	1.695	*****	91.1	*****	0.0	91.1	0.069	1.76	OK		
AMYL ACETATE (n-)	AML	5,000	5033	5208	29243	1.635	*****	86.7	*****	0.0	86.7	0.049	1.68	OK		
AMYL ACETATE (iso-)	IAT	5,000	5033	5208	29243	1.635	*****	86.7	*****	0.0	86.7	0.049	1.68	OK		
Amyl alcohol (iso-, n-, sec-, primary) (SEE ALSO IAA)	AAI	5,000	5030	5124	28770	1.635	*****	86.8	*****	0.0	86.8	0.048	1.68	OK		
Amyl alcohol (n-)	AAN	5,000	5030	5124	28770	1.635	*****	86.8	*****	0.0	86.8	0.048	1.68	OK		
Amyl alcohol (tert-)	AAI															
AMYL ALCOHOL, PRIMARY	APM	5,000	5030	5124	28770	1.635	*****	86.8	*****	0.0	86.8	0.048	1.68	OK		
AMYL ALCOHOL, (sec-)	ASE	5,000	5030	5124	28770	1.635	*****	86.8	*****	0.0	86.8	0.048	1.68	OK		
Amylene	AMZ															
AMYL ALCOHOL, (iso-)	IAA	5,000	5030	5124	28770	1.635	*****	86.8	*****	0.0	86.8	0.048	1.68	OK		
Amyl Methyl Ketone	AMK															
Amyl Tallate																
Asphalt	ASP															
ASPHALT BLENDING STOCKS: Roofers flux	ARF															
ASPHALT BLENDING STOCKS: Straight run residue	ASR															
Behenyl alcohol																
Benzene Tricarboxylic acid Trioctyl Ester																
Benzyl alcohol	BAL	5,000	5010	5052	28366	1.635	*****	86.2	*****	0.0	86.2	0.046	1.68	OK		
Bicyclic Terpenel Polyamide salt																
Brake fluid base mixtures (containing Poly(2-8)alkylene (C2-C3)	gBFX															
Butane	BMX															
Butene, SEE BUTYLENE																
Butane Oligomer	BOL															

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE III: MAX PRESSURE @ REMOTE TANK FOR
"VGR" * MAX ALLOWABLE LIQUID TRANSFER RATE

CARGO	C	MAX	VAPOR-				PIPE SECT I: LOSS		PIPE SECT II: LOSS		PIP'G		PRESS	IS
		LIQUID	AIR	REQUIRED AIR			FM REMOTE TK TO PV	FM REMOTE TK TO PV	REMOTE	•				
		TRANSF	MIX	EQUIVALENT	PRESS				TANK	REMOTE				
		RATE	FLOW		ACROSS	TOTAL	TOTAL	GRAND	TO P/V	TANK				
		I (MLTR)	RATE	-----	PV	LOSS	LOSS	TOTAL	Wv-a,11	PV +	Ptk <			
S	Q1	Qv-a	Qa	VALVE				HtotI	HtotII	Htot=	* Htot	Ploss	Ptk	MDWP
	(10)	(11)	(12)	PV						I+II				
	(BBL/	(BBL/	(BBL/	(FT^3/										
	HR)	HR)	HR)	HR)	(PSI)			(FT)	(FT)	(FT)	(PSI)	(PSI)		
Butyl Acetate (iso-, n-)	BAX	5,000	5060	5334	29947	1.635	*****	87.5	*****	0.0	87.5	0.051	1.69	OK
BUTYL ACETATE (N-)	BCN	5,000	5080	5443	30562	1.665	*****	88.1	*****	0.0	88.1	0.053	1.72	OK
Butyl Acetate (sec-)	BTA	5,000	5150	5822	32686	1.665	*****	90.1	*****	0.0	90.1	0.061	1.73	OK
Butyl alcohol (iso-, n-, sec-, tert-)		5,000	5090	5311	29822	1.635	*****	88.6	*****	0.0	88.6	0.051	1.69	OK
BUTYL ALCOHOL (ISO-)	IAL	5,000	5090	5311	29822	1.635	*****	88.6	*****	0.0	88.6	0.051	1.69	OK
BUTYL ALCOHOL (N-)	BAN	5,000	5050	5173	29046	1.635	*****	87.4	*****	0.0	87.4	0.048	1.68	OK
BUTYL ALCOHOL (SEC-)	BAS	5,000	5130	5449	30597	1.665	*****	89.8	*****	0.0	89.8	0.054	1.72	OK
BUTYL ALCOHOL (TERT-)	BAT	5,000	5280	5966	33495	1.665	*****	94.7	*****	0.0	94.7	0.064	1.73	OK
Butyl Benzyl Phthalate	BPH	5,000	5001	5016	28164	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
Butylene	BTN													
Butylene Glycol	BUG													
1,3-Butylene Glycol, SEE BUTYLENE GLYCOL														
Butylene Polyglycol, SEE BUTYLENE GLYCOL														
iso-Butyl Formate														
n-Butyl Formate														
Butyl Heptyl Ketone	BHK													
Butyl Methyl Ketone,SEE METHYL BUTYL KETONE														
Butyl Stearate														
Butyl Toluene	BUE	5,000	5010	5073	28484	1.635	*****	86.1	*****	0.0	86.1	0.047	1.68	OK
Butyrolactone (gamma)	BLA													
Calcium Alkylphenate														
Calcium Alkyl Salicylate														
Calcium Amino Nonyl Phenolate														
Calcium Carboxylate														
Caprolactam solutions	CLS	5,000	5005	5027	28227	1.635	*****	86.1	*****	0.0	86.1	0.046	1.68	OK
Carbon black base														
Cetyl alcohol (HEXADECANOL) SEE ALCOHOLS (C13 AND ABOVE)														
Cetyl-Stearal alcohol														
Cleaning spirit (unleaded)														
Coal tar														
Cumene	COR													
Cycloaliphatic resins	CUM	5,000	5060	5352	30047	1.665	*****	87.4	*****	0.0	87.4	0.052	1.72	OK
Cyclohexane	CHX	5,000	5450	6736	37823	1.695	*****	99.7	*****	0.0	99.7	0.081	1.78	OK
Cyclohexanol	CHN	5,000	5015	5072	28475	1.635	*****	86.3	*****	0.0	86.3	0.047	1.68	OK
1,3-Cyclopentadiene dimer (molten)	CPD	5,000	5025	5161	28976	1.635	*****	86.5	*****	0.0	86.5	0.048	1.68	OK
Cyclopentadiene polymers, SEE 1,3-CYCLOPENTADIENE DIMER (MOLTEN)														
Cymene (para-)	CMP	5,000	5011	5072	28479	1.635	*****	86.2	*****	0.0	86.2	0.047	1.68	OK
Decahydronaphthalene	DHN	5,000	5010	5068	28454	1.635	*****	86.1	*****	0.0	86.1	0.047	1.68	OK
Decaldehyde (iso-)	IDA	5,000	5001	5007	28114	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
Decaldehyde (n-)	DAL													
Decane	DDC													
Decene	DCE	5,000	5012	5082	28534	1.635	*****	86.2	*****	0.0	86.2	0.047	1.68	OK

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE III: MAX PRESSURE @ REMOTE TANK FOR
"VGR" * MAX ALLOWABLE LIQUID TRANSFER RATE

CARGO	C H R I S	MAX VAPOR- LIQUID AIR TRANSF MIX RATE FLOW (MLTR) RATE				PIPE SECT I: LOSS FM REMOTE TK TO PV				PIPE SECT II: LOSS FM REMOTE TK TO PV				PRESS DROP THRU PIP'G REMOTE TANK @ PRESS REMOTE TANK IS		
		REQUIRED AIR EQUIVALENT				PRESS ACROSS PV VALVE PV				TOTAL LOSS				GRAND TOTAL LOSS		
		Qa				HtotI				HtotII				Htot=I+II		
		(12)				(FT)				(FT)				(FT)		
		(PSI)				(PSI)				(PSI)				(PSI)		
Decyl alcohol (all isomers) (DECANOL)	DAX	5,000	5001	5008	28116	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK		
DECYL ALCOHOL (iso-)	ISA	5,000	5001	5008	28116	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK		
DECYL ALCOHOL (n-)	DAN	5,000	5001	5008	28116	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK		
Decylbenzene (n-)	DBZ	5,000	5001	5011	28135	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK		
Detergent Alkylate																
Diacetone alcohol	DAA	5,000	5010	5056	28389	1.635	*****	86.2	*****	0.0	86.2	0.046	1.68	OK		
Dialkyl (C10-C14) Benzenes	DAB															
Dialkyl (C7-C13) Phthalates	DAH															
Dibutyl Carbinol																
Dibutyl Phthalate (ortho-)	DPA															
Dicyclopentadiene, SEE 1,3-CYCLOPENTADIENE DIMER (MOLTEN)	DPT	5,000	5025	5161	28976	1.635	*****	86.5	*****	0.0	86.5	0.048	1.68	OK		
Diethylbenzene	DEB	5,000	5008	5053	28369	1.635	*****	86.1	*****	0.0	86.1	0.046	1.68	OK		
Diethylene Glycol	DEG	5,000	5001	5005	28102	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK		
Diethylene Glycol Butyl Ether	DME	5,000	5001	5008	28118	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK		
Diethylene Glycol Butyl Ether Acetate	DEM															
Diethylene Glycol Dibutyl Ether	DIG															
Diethylene Glycol Diethyl Ether																
Diethylene Glycol Ethyl Ether	DGE															
Diethylene Glycol Ethyl Ether Acetate	DGA	5,000	5002	5013	28147	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK		
Diethylene Glycol Methyl Ether	DGM	5,000	5003	5018	28172	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK		
Diethylene Glycol Methyl Ether Acetate	DGR															
Diethylene Glycol Phenyl Ether	DGP															
Diethylene Glycol Phthalate	DGL															
Di-(2-ethylhexyl)adipate	DEH															
Di-(2-ethylhexyl)phthalate	DIE															
Diethyl Phthalate	DPH															
Diglycidyl Ether of Bisphenol A	BDE															
Diheptyl Phthalate	DHP															
Dihexyl Phthalate	DHA															
Diisobutylcarbinol	DBC	5,000	5009	5064	28432	1.635	*****	86.1	*****	0.0	86.1	0.047	1.68	OK		
Diisobutylene	DBL	5,000	5200	6049	33962	1.665	*****	91.4	*****	0.0	91.4	0.065	1.73	OK		
Diisobutyl Ketone	DIK	5,000	5016	5112	28700	1.635	*****	86.3	*****	0.0	86.3	0.047	1.68	OK		
Diisobutyl Phthalate	DIT															
Diisodecyl Phthalate	DID															
Diisononyl Adipate	DNY															
Diisononyl Phthalate	DIN															
Diisooctyl Phthalate	DIO															
Diisopropylbenzene (all isomers)	DIX	5,000	5003	5024	28210	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK		
Diisopropyl Naphthalene	DII															
Dimethyl Adipate	DLA															
Dimethylbenzene																
Dimethyl Glutarate	DGT															

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE III: MAX PRESSURE @ REMOTE TANK FOR "VGR" * MAX ALLOWABLE LIQUID TRANSFER RATE

CARGO	C H R I S	"VGR" * MAX ALLOWABLE LIQUID TRANSFER RATE					PIPE SECT I: LOSS		PIPE SECT II: LOSS		PRESS DROPTHRU PIP'G REMOTE TANK TO P/V Wv-a,11 * Htot Ploss (PSI)	PRESS @ REMOTE TANK PV + Ploss Ptk (PSI)	IS Ptk < MDWP	
		LIQUID TRANSF RATE (MLTR) Q1 (10) (BBL/ HR)	VAPOR- AIR MIX FLOW RATE Qv-a (11) (BBL/ HR)	REQUIRED AIR EQUIVALENT Qa (12) (BBL/ HR)	PRESS ACROSS PV VALVE PV (PSI)	FM REMOTE TK TO PV		FM REMOTE TK TO PV						
						TOTAL LOSS HtotI (FT)	TOTAL LOSS HtotII (FT)	GRAND TOTAL LOSS Htot= I+II (FT)	GRAND TOTAL LOSS Htot= I+II (FT)					
Dimethyl Phthalate	***													
Dimethyl Polysiloxane	DTL													
2,2-Dimethylpropane-1,3-diol	DMP													
Dimethyl Succinate	DDI													
Dinonyl Phthalate	DSE													
Di(octylphenyl)amine	DIF	5,000	5001	5022	28195	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
Diocetyl Phthalate	DOP													
Dipentene	DPN	5,000	5010	5070	28466	1.635	*****	86.1	*****	0.0	86.1	0.047	1.68	OK
Diphenyl	DIL	5,000	5001	5008	28116	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
Diphenyl, Diphenyl Ether mixture	DDO	5,000	5001	5009	28121	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
Diphenyl Ether	DPE	5,000	5001	5009	28121	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
Diphenyl Ether, Biphenyl Ether mixture	DOB													
Dipropylene Glycol	DPG	5,000	5007	5046	28332	1.635	*****	86.1	*****	0.0	86.1	0.046	1.68	OK
Dipropylene Glycol Dibenzoate	DGY													
Dipropylene Glycol Methyl Ether	DPY													
DISTILLATES: Flashed feed stocks	DFF	5,000	5230	6056	34002	1.665	*****	92.5	*****	0.0	92.5	0.066	1.73	OK
DISTILLATES: Straight run	DSR	5,000	5230	6056	34002	1.665	*****	92.5	*****	0.0	92.5	0.066	1.73	OK
Diisodecyl Phthalate	DTP													
Diundecyl Phthalate	DUP													
Dodecane (all isomers)	DOC													
Dodecanol	DDN													
Dodecene (all isomers)	DOZ	5,000	5002	5017	28168	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
DODECENE	DOD	5,000	5002	5017	28168	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
Dodecylbenzene	DDB	5,000	5470	9704	54482	1.785	*****	97.4	*****	0.0	97.4	0.162	1.95	OK
Dodecyl Phenol	DOL													
Drilling mud (low toxicity) (if flammable or combustible)/														
Epoxytated linear alcohols, C11-C15														
Ethane	ETH													
2-Ethoxyethanol	EEO													
2-Ethoxyethyl Acetate	EEA													
Ethoxylated alcohols, C11-C15,SEE THE ALCOHOL POLYETHOXYLATES														
Ethoxy Triglycol (crude)	ETG													
Ethyl Acetate	ETA	5,000	5450	6822	38301	1.695	*****	99.3	*****	0.0	99.3	0.082	1.78	OK
Ethyl Acetoacetate	EAA	5,000	5020	5127	28785	1.635	*****	86.4	*****	0.0	86.4	0.048	1.68	OK
Ethyl alcohol (ETHANOL)	EAL	5,000	5350	5686	31926	1.665	*****	97.7	*****	0.0	97.7	0.058	1.72	OK
Ethyl Amyl Ketone	EAK													
Ethyl Benzene	ETB	5,000	5060	5295	29727	1.635	*****	87.5	*****	0.0	87.5	0.051	1.69	OK
Ethyl Butanol	EBT	5,000	5012	5059	28402	1.635	*****	86.3	*****	0.0	86.3	0.046	1.68	OK
Ethyl Butyrate	EBR	5,000	5100	5552	31174	1.665	*****	88.8	*****	0.0	88.8	0.056	1.72	OK
Ethyl Cyclohexane	ECY	5,000	5050	5269	29583	1.635	*****	87.2	*****	0.0	87.2	0.050	1.69	OK
Ethylene	ETL													
Ethylene Carbonate														

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE III: MAX PRESSURE @ REMOTE TANK FOR
"VGR" * MAX ALLOWABLE LIQUID TRANSFER RATE

CARGO	C H R I S	MAX LIQUID TRANSF RATE (MLTR) Q1 (10) (BBL/ HR)	VAPOR- AIR MIX FLOW RATE Qv-a (11) (BBL/ HR)	REQUIRED AIR EQUIVALENT Qa (12) (BBL/ HR)	(FT^3/ HR)	PRESS ACROSS PV VALVE PV (PSI)	PIPE SECT I: LOSS		PIPE SECT II: LOSS		GRAND TOTAL LOSS Htot-I+II (FT)	PRESS DROP THRU PIP'G REMOTE TANK TO P/V Wv-a, 11 * Htot Ploss (PSI)	PRESS @ REMOTE TANK PV + Ploss Ptk (PSI)	IS Ptk < MDWP
							FM REMOTE TK TO PV		FM REMOTE TK TO PV					
							TOTAL LOSS HtotI (FT)		TOTAL LOSS HtotII (FT)					
Ethylene Glycol	***													
Ethylene Glycol Acetate	EGL	5,000	5001	5003	28089	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
Ethylene Glycol Butyl Ether	EGO													
ETHYLENE GLYCOL BUTYL ETHER ACETATE	EGM													
Ethylene Glycol Ether Acetate	EMA	5,000	5005	5040	28297	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
Ethylene Glycol Tert-Butyl Ether														
Ethylene Glycol Diacetate														
Ethylene Glycol Dibutyl Ether	EGY	5,000	5001	5007	28114	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
Ethylene Glycol Ethyl Ether, SEE 2-ETHOXYETHANOL	EGB													
Ethylene Glycol Ethyl Ether Acetate, SEE 2-ETHOXYETHYL ACETATE	EGF													
Ethylene Glycol Isopropyl Ether	EGA													
Ethylene Glycol Methyl Butyl Ether	EGI													
Ethylene Glycol Methyl Ether														
Ethylene Glycol Methyl Ether Acetate	EME	5,000	5001	5007	28112	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
Ethylene Glycol Phenyl Ether	EGT													
Ethylene Glycol Phenyl Ether, Diethylene Glycol Phenyl Ether mixt	EPE	5,000	5001	5007	28112	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
Ethylene-Propylene Copolymer (in liquid mixtures)	EDX													
Ethyl-3-Ethoxypropionate														
2-Ethylhexaldehyde, SEE OCTYL ALDEHYDES	EEP													
2-Ethylhexanoic acid	EHA	5,000	5017	5106	28668	1.635	*****	86.3	*****	0.0	86.3	0.047	1.68	OK
2-Ethylhexanol, SEE OCTANOL (ALL ISOMERS)	ENO													
Ethylhexoic acid, SEE 2-ETHYLHEXANOIC ACID	EHX	5,000	5002	5013	28145	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
Ethyl Hexyl Phthalate (SEE ALSO DI 2-ETHYLHEXYL PHTHALATE)	EHE													
Ethyl Hexyl Tallate	EHT													
Ethyl Propionate	EPR	5,000	5350	5686	31926	1.665	*****	97.7	*****	0.0	97.7	0.058	1.72	OK
Ethyl Toluene	ETE	5,000	5028	5163	28989	1.635	*****	86.6	*****	0.0	86.6	0.048	1.68	OK
Fatty acid (saturated, C13 and above)														
Fatty acid Amides														
Formamide														
Furfuryl Alcohol	FAM	5,000	5010	5019	28177	1.635	*****	86.3	*****	0.0	86.3	0.046	1.68	OK
Gas oil, cracked	FAL	5,000	5005	5024	28205	1.635	*****	86.1	*****	0.0	86.1	0.046	1.68	OK
GASOLINE BLENDING STOCKS: Alkylates	GOC													
GASOLINE BLENDING STOCKS: Reformates	GAK	5,000	6250	10555	59261	1.815	*****	127.0	*****	0.0	127.0	0.191	2.01	OK
GASOLINES: Automotive (containing not over 4.23 grams lead per gallon)	GRF	5,000	6250	10555	59261	1.815	*****	127.0	*****	0.0	127.0	0.191	2.01	OK
GASOLINES: Aviation (containing not over 4.86 grams lead per gallon)	GAT	5,000	6250	10555	59261	1.815	*****	127.0	*****	0.0	127.0	0.191	2.01	OK
GASOLINES: Casinghead (natural)	GAV	5,000	6250	10555	59261	1.815	*****	127.0	*****	0.0	127.0	0.191	2.01	OK
GASOLINES: Polymer	GCS	5,000	6250	10555	59261	1.815	*****	127.0	*****	0.0	127.0	0.191	2.01	OK
GASOLINES: Straight run	GPL	5,000	6250	10555	59261	1.815	*****	127.0	*****	0.0	127.0	0.191	2.01	OK
Glycerine	GSR	5,000	6250	10555	59261	1.815	*****	127.0	*****	0.0	127.0	0.191	2.01	OK
Glycerol, SEE GLYCERINE	GCR													
Glycerol Polyalkoxylate														
Glycerol Triacetate														

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE III: MAX PRESSURE @ REMOTE TANK FOR
"VGR" * MAX ALLOWABLE LIQUID TRANSFER RATE

CARGO	***** TANK FOR VGR * MAX ALLOWABLE LIQUID TRANSFER RATE *****												PRESS	DROP	THRU	PRESS	IS
	C H R I S	LIQUID TRANSF RATE (MLTR) Q1 (10) (BBL/ HR)	VAPOR- AIR MIX FLOW RATE Qv-a (11) (BBL/ HR)	REQUIRED AIR EQUIVALENT Qa (12) (BBL/ HR)	(FT^3/ HR)	PRESS ACROSS PV VALVE PV (PSI)	PIPE SECT I: LOSS		PIPE SECT II: LOSS		GRAND TOTAL LOSS Htot=I+II (FT)	TANK TO P/V Wv-a, 11 * Htot Ploss (PSI)	REMOTE TANK PV + Ptk (PSI)	MDWP			
							FM REMOTE	TK TO PV	FM REMOTE	TK TO PV							
							TOTAL LOSS HtotI (FT)	TOTAL LOSS HtotII (FT)									
Glycidyl Ester of Tertiary Carboxylic acid, SEE GLYCIDYL ESTER OF TRI	***																
Glycidyl Ester of Tridecyl Acetic acid																	
Glycidyl Ester of Versatic acid, SEE GLYCIDYL ESTER OF TRIDECYL ACETI																	
Glycol Diacetate, SEE ETHYLENE GLYCOL DIACETATE																	
Glycols, Resins and Solvents mixtures																	
Gylcol Triacetate, SEE GLYCERYL TRIACETATE																	
Glyoxal solution (40% or less)																	
Grease																	
Heptadecane																	
Heptane (all isomers) (METHYHEXANE)																	
HEPTANE (N-)	HMX 5,000	5250	6163	34604	1.665	*****	93.2	*****	0.0	93.2	0.068	1.73	OK				
Heptanoic acid	HPT 5,000	5250	6163	34604	1.665	*****	93.2	*****	0.0	93.2	0.068	1.73	OK				
Heptanol (all isomers)	HEP 5,000	5001	5006	28109	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK				
HEPTANOL	HTX 5,000	5004	5023	28200	1.635	*****	86.1	*****	0.0	86.1	0.046	1.68	OK				
Heptene (all isomers)	HTN 5,000	5004	5023	28200	1.635	*****	86.1	*****	0.0	86.1	0.046	1.68	OK				
HEPTENE (1-)	HFX 5,000	5290	6325	35513	1.695	*****	94.2	*****	0.0	94.2	0.071	1.77	OK				
Heptyl Acetate	HTE 5,000	5280	6280	35262	1.695	*****	93.9	*****	0.0	93.9	0.070	1.77	OK				
Herbicide (C15 -H22 -NO2 -CI), SEE METOLACHLOR	HPE 5,000	5010	5079	28518	1.635	*****	86.1	*****	0.0	86.1	0.047	1.68	OK				
Hexaethylene Glycol																	
Hexamethylene Glycol																	
Hexamethylenetetramine solutions																	
Hexane (all isomers)																	
HEXANE	HTS																
Hexanoic acid	HXS 5,000	5700	7783	43696	1.725	*****	107.8	*****	0.0	107.8	0.106	1.83	OK				
Hexanol	HXA 5,000	5700	7783	43696	1.725	*****	107.8	*****	0.0	107.8	0.106	1.83	OK				
Hexene (all isomers)	HXO 5,000	5001	5006	28105	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK				
HEXENE (1-)	HXN 5,000	5100	5482	30782	1.665	*****	88.8	*****	0.0	88.8	0.054	1.72	OK				
HEXENE (2-)	HEX 5,000	5800	8075	45338	1.755	*****	111.3	*****	0.0	111.3	0.114	1.87	OK				
Hexyl Acetate	HKE 5,000	5820	8152	45769	1.755	*****	111.9	*****	0.0	111.9	0.116	1.87	OK				
Hexylene Glycol	HXT 5,000	5820	8152	45769	1.755	*****	111.9	*****	0.0	111.9	0.116	1.87	OK				
Hog Grease, SEE LARD	HAE																
2-Hydroxy-4- (methylthio)butanoic acid	HXG 5,000	5001	5001	28080	1.635	*****	86.0	*****	0.0	86.0	0.045	1.68	OK				
HYDROCARBON 5-9 (MOVED TO SUB-O, NON TABLE 151, 6/24/95)	HBA																
Hydroxy terminated Polybutadiene, SEE POLYBUTADIENE, HYDROXYL TERMINA	HFN																
Isophorone	IPH 5,000	5001	5007	28111	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK				
JET FUELS: JP-1 (Kerosene)	JPO 5,000	5014	5089	28575	1.635	*****	86.3	*****	0.0	86.3	0.047	1.68	OK				
JET FUELS: JP-3	JPT 5,000	5851	9858	55348	1.815	*****	111.5	*****	0.0	111.5	0.167	1.98	OK				
JET FUELS: JP-4	JPF 5,000	5340	6817	38275	1.695	*****	95.4	*****	0.0	95.4	0.082	1.78	OK				
JET FUELS: JP-5 (Kerosene, heavy)	JPV 5,000	5010	5056	28389	1.635	*****	86.2	*****	0.0	86.2	0.046	1.68	OK				
JET FUELS: JP-8	JPE																
Kerosene	KRS 5,000	5015	5096	28610	1.635	*****	86.3	*****	0.0	86.3	0.047	1.68	OK				
Lactic acid																	

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE III: MAX PRESSURE @ REMOTE TANK FOR
"VGR" * MAX ALLOWABLE LIQUID TRANSFER RATE

CARGO	C H R I S	***** MAX ALLOWABLE LIQUID TRANSFER RATE *****										PRESS DROP THRU PIP'G REMOTE		IS Ptk < MDWP
		LIQUID TRANSF RATE (MLTR) Q1 (10) (BBL/HR)	VAPOR- AIR MIX FLOW RATE Qv-a (11) (BBL/HR)	REQUIRED AIR EQUIVALENT Qa (12) (BBL/HR)	PRESS ACROSS PV VALVE PV (PSI)	PIPE SECT I: LOSS FM REMOTE TK TO PV		PIPE SECT II: LOSS FM REMOTE TK TO PV		GRAND TOTAL LOSS Htot-I+II (FT)	TANK REMOTE TO P/V Wv-a, 11 * Htot Ploss (PSI)	TANK REMOTE PV + Ploss (PSI)		
						TOTAL LOSS HtotI (FT)	TOTAL LOSS HtotII (FT)	TOTAL LOSS HtotI (FT)	TOTAL LOSS HtotII (FT)					
Lard	***													
Latex, liquid synthetic, including: Styrene-Butadien rubber	LLS													
Latex, liquid synthetic, including: Carboxylated Styrene-Butadien Cop														
Magnesium Nonyl Phenol Sulfide														
Magnesium Sulfonate														
Maleic Anhydride Copolymer	MSE													
2-Mercaptobenzothiazol (in liquid mixtures)														
Methane														
3-Methoxy-1-Butanol	MTH													
3-Methoxybutyl Acetate														
1-Methoxy-2-Propyl Acetate	MOA													
Methoxy Trigylcol, SEE TRIETHYLENE GLYCOL METHYL ETHER	MPO													
Methyl Acetate	MTG													
Methyl Acetoacetate	MTT 5,000	5610	7102	39873	1.695	*****	105.3	*****	0.0	105.3	0.089	1.78	OK	
Methyl alcohol (SEE METHANOL)	MAE													
Methyl Amyl Acetate	MAL 5,000	5663	5778	32440	1.665	*****	109.5	*****	0.0	109.5	0.060	1.73	OK	
Methyl Amyl alcohol	MAC 5,000	5033	5233	29379	1.635	*****	86.7	*****	0.0	86.7	0.050	1.68	OK	
Methyl Amyl Ketone	MAA 5,000	5043	5209	29246	1.635	*****	87.1	*****	0.0	87.1	0.049	1.68	OK	
Methyl Butanol, SEE THE AMYL ALCOHOLS	MAK													
Methyl Butenol	MBL													
Methyl n-Butyl Ketone	MBK 5,000	5097	5465	30685	1.665	*****	88.7	*****	0.0	88.7	0.054	1.72	OK	
Methyl Butynol	MBY													
Methyl Butyrate	MBU 5,000	5126	5608	31485	1.665	*****	89.7	*****	0.0	89.7	0.057	1.72	OK	
Methyl Ethyl Ketone	MEK 5,000	5450	6487	36421	1.695	*****	100.0	*****	0.0	100.0	0.075	1.77	OK	
Methyl Formal (DIMETHYL FORMAL)	MTF 5,000	6542	10391	58343	1.815	*****	139.4	*****	0.0	139.4	0.186	2.00	OK	
Methyl Heptyl Ketone	MHK 5,000	5006	5042	28309	1.635	*****	86.1	*****	0.0	86.1	0.046	1.68	OK	
Methyl Isobutyl Carbinol, SEE METHYL AMYL ALCOHOL	MIC													
Methyl Isobutyl Ketone	MIK 5,000	5115	5542	31116	1.665	*****	89.3	*****	0.0	89.3	0.055	1.72	OK	
3-Methyl-3-Methoxybutanol														
3-Methyl-3-Methoxybutyl Acetate														
1-Methyl Naphthalene	MNA 5,000	5001	5007	28113	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK	
Methyl Pentene														
2-METHYL-1-PENTENE	MPN 5,000	5630	7424	41684	1.725	*****	105.4	*****	0.0	105.4	0.097	1.82	OK	
5-METHYL-1-PENTENE	MTN 5,000	5849	8263	46394	1.755	*****	113.0	*****	0.0	113.0	0.119	1.87	OK	
N-Methyl-2-Pyrrolidone	MPY													
Methyl Tert-Butyl Ether (MTBE)	MBE 5,000	5004	5017	28169	1.635	*****	86.1	*****	0.0	86.1	0.046	1.68	OK	
Metolachlor	MCO													
Mineral spirits	MNS 5,000	5020	5121	28754	1.635	*****	86.4	*****	0.0	86.4	0.048	1.68	OK	
Myrcene	MRE 5,000	5017	5114	28710	1.635	*****	86.3	*****	0.0	86.3	0.047	1.68	OK	
NAPHTHA: Aromatic (Having less than 10% Benzene).														
NAPHTHA: Cracking fraction														
NAPHTHA: Heavy														

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

CARGO

TABLE III: MAX PRESSURE @ REMOTE TANK FOR
"VGR" * MAX ALLOWABLE LIQUID TRANSFER RATE

C H R I S	MAX LIQUID TRANSF RATE (MLTR)		VAPOR- AIR MIX FLOW RATE (Qv-a)		REQUIRED AIR EQUIVALENT		PRESS ACROSS PV VALVE (PSI)	PIPE SECT I: LOSS FM REMOTE TK TO PV		PIPE SECT II: LOSS FM REMOTE TK TO PV		GRAND TOTAL LOSS Htot= I+II (FT)	PRESS DROP THRU PIP'G REMOTE TANK TO P/V Wv-a,11 * Htot Ploss (PSI)	PRESS @ REMOTE TANK PV + Ptk (PSI)	IS Ptk < MDWP
	Q1 (10) (BBL/HR)	Qv-a (11) (BBL/HR)	Qa (12) (BBL/HR)	(FT^3/HR)	TOTAL LOSS HtotI (FT)	TOTAL LOSS HtotII (FT)									
PTN															
NSV 5,000		5020	5097	28617	1.635	*****	86.4	*****							
NSS 5,000		5020	5121	28754	1.635	*****	86.4	*****	0.0	86.4	0.047	1.68	OK		
NVM 5,000		5019	5115	28720	1.635	*****	86.4	*****	0.0	86.4	0.048	1.68	OK		
solNFES									0.0	86.4	0.047	1.68	OK		
NTI															
NAX 5,000		5027	5168	29014	1.635	*****	86.6	*****							
NAN 5,000		5027	5168	29014	1.635	*****	86.6	*****	0.0	86.6	0.048	1.68	OK		
NNA							86.6	*****	0.0	86.6	0.048	1.68	OK		
NON 5,000		5035	5211	29260	1.635	*****	86.8	*****							
NNS 5,000		5010	5072	28475	1.635	*****	86.1	*****	0.0	86.8	0.049	1.68	OK		
NNN 5,000		5010	5072	28475	1.635	*****	86.1	*****	0.0	86.1	0.047	1.68	OK		
NNI 5,000		5010	5072	28475	1.635	*****	86.1	*****	0.0	86.1	0.047	1.68	OK		
NNP 5,000		5001	5011	28136	1.635	*****	86.1	*****	0.0	86.1	0.047	1.68	OK		
NPE							86.0	*****	0.0	86.0	0.046	1.68	OK		
ompone															
al com															
ODD															
OAX 5,000		5079	5426	30467	1.665	*****	88.1	*****							
OAN 5,000		5079	5426	30467	1.665	*****	88.1	*****	0.0	88.1	0.053	1.72	OK		
OAA 5,000		5001	5007	28114	1.635	*****	86.0	*****	0.0	88.1	0.053	1.72	OK		
OCX 5,000		5001	5006	28109	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK		
OTA 5,000		5001	5006	28109	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK		
OTX 5,000		5090	5485	30795	1.665	*****	86.0	*****	0.0	86.0	0.046	1.68	OK		
OTE 5,000		5100	5532	31060	1.665	*****	88.5	*****	0.0	86.0	0.046	1.68	OK		
							88.8	*****	0.0	88.5	0.054	1.72	OK		
OCK 5,000		5001	5006	28109	1.635	*****	88.8	*****	0.0	88.8	0.055	1.72	OK		
IOA 5,000		5001	5006	28109	1.635	*****	86.0	*****							
OAL							86.0	*****	0.0	86.0	0.046	1.68	OK		
ODA									0.0	86.0	0.046	1.68	OK		
OET															
ODD															
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CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE III: MAX PRESSURE @ REMOTE TANK FOR
"VGR" * MAX ALLOWABLE LIQUID TRANSFER RATE

CARGO	C H R I S	"VGR" * MAX ALLOWABLE LIQUID TRANSFER RATE						PIPE SECT I: LOSS		PIPE SECT II: LOSS		PRESS DROPTHRU PIP'G PRESS TANK REMOTE TO P/V TANK Wv-a,11 PV + Ptk < * Htot Ploss Ptk (PSI) (PSI)	IS Ptk < MDWP
		MAX	VAPOR-	REQUIRED AIR EQUIVALENT	PRESS ACROSS PV VALVE PV (PSI)	FM REMOTE TK TO PV	FM REMOTE TK TO PV	TOTAL LOSS HtotI (FT)	TOTAL LOSS HtotII (FT)	GRAND TOTAL LOSS Htot= I+II (FT)			
		LIQUID	AIR										
		TRANSF RATE (MLTR) Q1 (10) (BBL/ HR)	MIX FLOW RATE Qv-a (11) (BBL/ HR)										
OIL, EDIBLE: Cod liver	***												
OIL, EDIBLE: Corn													
OIL, EDIBLE: Cottonseed	OCO												
OIL, EDIBLE: Fish, N.O.S.	OCS												
OIL, EDIBLE: Grapeseed	OFS												
OIL, EDIBLE: Groundnut													
OIL, EDIBLE: Hazelnut													
OIL, EDIBLE: Lard													
OIL, EDIBLE: Maize	OLD												
OIL, EDIBLE: Mustard seed													
OIL, EDIBLE: Nutmeg Butter													
OIL, EDIBLE: Olive													
OIL, EDIBLE: Palm	OOL												
OIL, EDIBLE: Palm kernel	OPM												
OIL, EDIBLE: Peanut	OPO												
OIL, EDIBLE: Poppy	OPN												
OIL, EDIBLE: Raisin seed													
OIL, EDIBLE: Rice bran													
OIL, EDIBLE: Safflower	ORP												
OIL, EDIBLE: Salad	OSF												
OIL, EDIBLE: Sesame													
OIL, EDIBLE: Soya bean													
OIL, EDIBLE: Sunflower, SEE SUNFLOWER SEED	OSB												
OIL, EDIBLE: Sunflower seed													
OIL, EDIBLE: Tucum	OSN												
OIL, EDIBLE: Vegetable, N.O.S.	OTC												
OIL, EDIBLE: Walnut	OVG												
OIL, FUEL: No. 1 (Kerosene)													
OIL, FUEL: No. 1-D	OON												
OIL, FUEL: No. 2	OOD												
OIL, FUEL: No. 2-D	OTW 5,000	5056	5635	31636	1.665	*****	86.8	*****	0.0	86.8	0.057	1.72	OK
OIL, FUEL: No. 4	OTD												
OIL, FUEL: No. 5	OPR 5,000	5015	5070	28469	1.635	*****	86.3	*****	0.0	86.3	0.047	1.68	OK
OIL, FUEL: No. 6	OPV 5,000	5015	5070	28469	1.635	*****	86.3	*****	0.0	86.3	0.047	1.68	OK
OIL, MISC: Absorption	OSX 5,000	5015	5070	28469	1.635	*****	86.3	*****	0.0	86.3	0.047	1.68	OK
OIL, MISC: Aliphatic	OAS												
OIL, MISC: Animal, N.O.S.													
OIL, MISC: Aromatic													
OIL, MISC: Aviation F2300													
OIL, MISC: Clarified													
OIL, MISC: Coal	OCF												
OIL, MISC: Coconut oil, esterified, SEE COCONUT OIL, FATTY ACID METHY													

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE III: MAX PRESSURE @ REMOTE TANK FOR
"VGR" * MAX ALLOWABLE LIQUID TRANSFER RATE

CARGO	C H R I S	MAX LIQUID TRANSF RATE (MLTR Q1 (10) (BBL/ HR)	VAPOR- AIR MIX FLOW RATE Qv-a (11) (BBL/ HR)	REQUIRED AIR EQUIVALENT Qa (12) (BBL/ HR)	(FT^3/ HR)	PRESS ACROSS PV VALVE PV (PSI)	PIPE SECT I: LOSS		PIPE SECT II: LOSS		GRAND TOTAL LOSS Htot= I+II (FT)	PRESS DROPS THRU PIP'G REMOTE TANK TO P/V Wv-a,11 * Htot Ploss (PSI)	PRESS @ TANK REMOTE PV + Ploss Ptk (PSI)	IS Ptk < MDWP
							FM REMOTE TK TO PV		FM REMOTE TK TO PV					
							TOTAL LOSS		TOTAL LOSS					
							HtotI (FT)		HtotII (FT)					
OIL, MISC: Coconut oil, fatty acid														
OIL, MISC: Coconut oil, fatty acid Methyl Ester														
OIL, MISC: Coconut oil, Methyl Ester, SEE COCONUT OIL FATTY ACID METH														
OIL, MISC: Cottonseed, fatty acid, SEE COTTONSEED OIL, FATTY ACIDCFY														
OIL, MISC: Croton														
OIL, MISC: Crude														
OIL, MISC: Diesel														
OIL, MISC: Gas, low pour		OIL 5,000	6250	6319	35479	1.695	*****	132.7	*****	0.0	132.7	0.072	1.77	OK
OIL, MISC: Gas, low sulfur		ODS 5,000	5069	5322	29880	1.635	*****	87.8	*****	0.0	87.8	0.051	1.69	OK
OIL, MISC: Heartcut distillate														
OIL, MISC: Lanolin														
OIL, MISC: Linseed														
OIL, MISC: Lubricating														
OIL, MISC: Mineral														
OIL, MISC: Mineral seal		OLB 5,000	5015	5015	28158	1.635	*****	86.4	*****	0.0	86.4	0.046	1.68	OK
OIL, MISC: Motor														
OIL, MISC: Neatsfoot														
OIL, MISC: Oiticica														
OIL, MISC: Palm oil, fatty acid Methyl Ester														
OIL, MISC: Palm oil, Methyl Ester, SEE SEE PALM OIL, FATTY ACID														
OIL, MISC: Penetrating														
OIL, MISC: Perilla														
OIL, MISC: Pilchard														
OIL, MISC: Pine														
OIL, MISC: Range														
OIL, MISC: Residual														
OIL, MISC: Resin														
OIL, MISC: Resinous petroleum														
OIL, MISC: Road														
OIL, MISC: Rosin														
OIL, MISC: Seal														
OIL, MISC: Soapstock														
OIL, MISC: Soya bean (epoxidized)														
OIL, MISC: Sperm														
OIL, MISC: Spindle														
OIL, MISC: Spray														
OIL, MISC: Tall														
OIL, MISC: Tall, fatty acid														
OIL, MISC: Tanner's														
OIL, MISC: Transformer														
OIL, MISC: Tung														
OIL, MISC: Turbine														
		OTB 5,000	5030	5231	29370	1.635	*****	86.6	*****	0.0	86.6	0.050	1.68	OK

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE III: MAX PRESSURE • REMOTE TANK FOR
"VGR" • MAX ALLOWABLE LIQUID TRANSFER RATE

MAX ALLOWABLE LIQUID TRANSFER RATE										PRESS	DROP	THRU	PIP'G	PRESS	IS
CHRSIS	MAX	VAPOR-			PIPE SECT I: LOSS		PIPE SECT II: LOSS								
	LIQUID	AIR				FM	REMOTE TK TO PV	FM	REMOTE TK TO PV			REMOTE			
	TRANSF	MIX	REQUIRED AIR	PRESS								TANK	REMOTE		
	RATE	FLOW	EQUIVALENT	ACROSS								TO P/V	TANK	Ptk	<
	(MLTR)	RATE		PV	TOTAL			TOTAL	GRAND			Nv-a,11	PV +	Ploss	MDWP
Q1	Qv-a	Qa	VALVE	LOSS			LOSS	LOSS			* Htot	Htot	Ptk		
(10)	(11)	(12)	PV												
(BBL/	(BBL/	(BBL/	(FT^3/				HtotI	HtotII	Htot=						
HR)	HR)	HR)	HR)	(PSI)			(FT)	(FT)	(FT)		(PSI)	(PSI)			

OIL, MISC: Whale	OAM											
OIL, MISC: White (mineral)	OLA											
OIL, MISC: Wood												
alpha-Olefins (C13 - C18)												
Olefins (C13 and above, all isomers)												
Oleic acid												
Oleyl alcohol (OCTADECENOL), SEE ALCOHOLS (C13 AND ABOVE)												
Organic Amine 70, SEE AMINOETHYLDIETHANOLAMINE, AMINOETHYL-ETHANOLAMI												
Palm Stearin												
n-Paraffins (C10 - C20)	PMS											
Pentadecanol, SEE SEE ALCOHOLS (C13 AND ABOVE)	PFN											
Pentaethylene Glycol	PDC 5,000	5001	5012	28139	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68 OK
Pentaethylenhexamine	PEP											
Pentane (all isomers)	PTY 5,000	7100	12130	68103	1.890	*****	163.1	*****	0.0	163.1	0.252	2.14 OK
PENTANE (iso-)	IPT 5,000	7700	14337	80495	2.015	*****	190.5	*****	0.0	190.5	0.349	2.36 OK
PENTANE (n-)	PTA 5,000	7044	11980	67265	1.890	*****	160.5	*****	0.0	160.5	0.246	2.14 OK
Pentanoic acid	PTX 5,000	7490	13298	74660	1.930	*****	180.9	*****	0.0	180.9	0.301	2.23 OK
Pentene (all isomers)	PTE 5,000	7490	13298	74660	1.930	*****	180.9	*****	0.0	180.9	0.301	2.23 OK
PENTENE (1-)	PTL											
Petrolatum	PXE											
1-Phenyl-1-Xylyl Ethane												
Phosphosulfurized Bicyclic Terpene												
Phthalate plasticizers, SEE INDIVIDUAL PHTHALATES												
Pinene												
Polyalkenyl Succinic Anhydride Amine	PIN 5,000	5035	5232	29378	1.635	*****	86.7	*****	0.0	86.7	0.050	1.68 OK
Polyalkylene Glycols, Polyalkylene Glycol Monoalkyl Ethers mixtur	PPX											
Polyalkylene Oxide Polyol	PAO											
Polamine, Amide mixture												
Polybutadiene, Hydroxyl terminated												
Polybutene												
Polydimethylsiloxane	PLB 5,000	5001	5121	28750	1.635	*****	85.7	*****	0.0	85.7	0.048	1.68 OK
Polyethylene Glycol												
Polyethylene Glycol Dimethyl Ether												
Polyglycerol												
Polyisobutylene, SEE POLYBUTENE												
Polymerized Esters												
Poly(20)oxyethylene Sorbitan Monooleate												
Polypropylene	PSM											
Polypropylene Glycol	PLP											
Polypropylene Glycol Methyl Ether	PGC 5,000	5010	5010	28130	1.635	*****	86.3	*****	0.0	86.3	0.046	1.68 OK
Polysiloxane	PGM 5,000	5080	5338	29972	1.635	*****	88.2	*****	0.0	88.2	0.051	1.69 OK
Polystyrene Diakyl Maleate												

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE III: MAX PRESSURE @ REMOTE TANK FOR
"VGR" * MAX ALLOWABLE LIQUID TRANSFER RATE

CARGO	"VGR" * MAX ALLOWABLE LIQUID TRANSFER RATE										PRESS DROP THRU PIP'G REMOTE TANK		IS Ptk < MDWP
	C H R I S	LIQUID TRANSF RATE (MLTR) (10) (BBL/HR)	VAPOR- AIR MIX FLOW RATE (BBL/HR)	REQUIRED AIR EQUIVALENT (BBL/HR)	PRESS ACROSS PV VALVE PV (PSI)	PIPE SECT I: LOSS FM REMOTE TK TO PV		PIPE SECT II: LOSS FM REMOTE TK TO PV		GRAND TOTAL LOSS Htot= I+II (FT)	TO P/V Wv-a, 11 Ploss (PSI)		
						TOTAL LOSS HtotI (FT)	TOTAL LOSS HtotII (FT)						
Potassium Oleate	***												
Propane	POE												
n-Propoxypropanol	PRP												
Propyl Acetate (iso-)	PXP												
Propyl Acetate (n-)	IAC 5,000	5180	5861	32905	1.665	*****	91.1	*****	0.0	91.1	0.062	1.73	OK
Propyl alcohol (iso-)	PAT 5,000	5185	5884	33036	1.665	*****	91.3	*****	0.0	91.3	0.062	1.73	OK
Propyl alcohol (n-)	IPA 5,000	5300	5801	32573	1.665	*****	95.4	*****	0.0	95.4	0.060	1.73	OK
Propylbenzene (n-)	PAL 5,000	5120	5319	29865	1.635	*****	89.6	*****	0.0	89.6	0.051	1.69	OK
iso-Propylcyclohexane	PBZ 5,000	5020	5116	28727	1.635	*****	86.4	*****	0.0	86.4	0.047	1.68	OK
Propylene	IPX 5,000	5001	5006	28108	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
Propylene-Butylene Copolymer	PPL												
Propylene Dimer	PBP												
Propylene Glycol (1,2-PROPANDIOL)	PDR												
Propylene Glycol Monoalkyl Ether	PPG 5,000	5001	5004	28093	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
Propylene Glycol Ethyl Ether	PGE												
Propylene Glycol Methyl Ether	PGY												
Propylene Polymer (in liquid mixtures)	PME 5,000	5070	5296	29736	1.635	*****	87.9	*****	0.0	87.9	0.051	1.69	OK
Propylene Tetramer	PTT 5,000	5002	5002	28085	1.635	*****	86.0	*****	0.0	86.0	0.045	1.68	OK
Propylene Trimer	PTR												
Pseudocumene, SEE TRIMETHYLBENZENES													
Rum													
Sodium Acetate, Glycol, water solutions													
Sodium Acetate solution													
Sodium Benzoate solution													
Sodium Sulfonate													
Stearic acid													
Stearyl alcohol (Octadecanol)													
Sulfolane													
Tallow													
Tallow alcohol, SEE ALCOHOLS (C13 AND ABOVE)													
Tallow fatty acid													
Tallow Alkyl Nitride													
Tetradecanol													
1-Tetradecene, SEE THE OLEFIN OR ALPHA-OLEFIN ENTRIES													
Tetradecylbenzene													
Tetraethylene Glycol													
Tetrahydronaphthalene													
Tetrapropylbenzene, SEE ALKYL(C9-C17) BENZENES													
Toluene													
Triaryphosphate													
Tributyl Phosphate													
Tricresyl Phosphate (less than 1% of the ortho isomer)													
	TBP												
	TCP 5,000	5001	5019	28180	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE III: MAX PRESSURE @ REMOTE TANK FOR
"VGR" * MAX ALLOWABLE LIQUID TRANSFER RATE

PRESSURE @ REMOTE TANK FOR														PRESS
CARGO	C H R I S	***** MAX ALLOWABLE LIQUID TRANSFER RATE *****					PIPE SECT I: LOSS		PIPE SECT II: LOSS		GRAND TOTAL LOSS Htot= I+II (FT)	PRESS DROP THRU PIP'G REMOTE TANK TO P/V Wv-a,11 * Htot Ploss (PSI)	PRESS @ REMOTE TANK PV + Ptk Ptk (PSI)	IS Ptk < MDWP
		LIQUID	VAPOR-	REQUIRED AIR EQUIVALENT	PRESS ACROSS PV VALVE PV (PSI)	FM REMOTE TK TO PV	FM REMOTE TK TO PV	TOTAL LOSS HtotI (FT)	TOTAL LOSS HtotII (FT)					
		TRANSF	AIR											
		RATE	MIX											
		(MLTR)	FLOW											
Q1	Qv-a	Qa												
(10)	(11)	(12)	(FT ³ /											
(BBL/	(BBL/	(BBL/	HR)											
HR)	HR)	HR)												
Tridecane	***													
Tridecanoic acid	TRD	5,000	5002	5019	28178	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
Tridecanol, SEE ALCOHOLS (C13 AND ABOVE)														
1-Tridecene	TDN	5,000	5001	5010	28130	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
Tridecylbenzene	TDC	5,000	5001	5009	28125	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
Triethylbenzene	TRB													
Triethylene Glycol	TEB	5,000	5002	5016	28164	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
Triethylene Glycol Butyl Ether	TEG	5,000	5001	5008	28115	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
Triethylene Glycol Butyl Ether mixture														
Triethylene Glycol di-(2-ethylbutyrate)														
Triethylene Glycol Ether mixture	TGD													
Triethylene Glycol Ethyl Ether														
Triethylene Glycol Methyl Ether	TGE													
Triethyl Phosphate														
Triisooctyl Trimellitate	TPS	5,000	5002	5018	28176	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
Triisopropanolamine														
Trimethylbenzenes (all isomers)	TIP													
TRIMETHYL BENZENE (1,2,5-)	TRE	5,000	5014	5083	28539	1.635	*****	86.3	*****	0.0	86.3	0.047	1.68	OK
TRIMETHYL BENZENE (1,2,3-)	TMB	5,000	5014	5082	28531	1.635	*****	86.3	*****	0.0	86.3	0.047	1.68	OK
TRIMETHYL BENZENE (1,2,4-) (PSEUDOCUMENE)	TMD	5,000	5014	5082	28531	1.635	*****	86.3	*****	0.0	86.3	0.047	1.68	OK
Trimethylol Propane Polyethoxylate	TME	5,000	5014	5082	28531	1.635	*****	86.3	*****	0.0	86.3	0.047	1.68	OK
2,2,4-Trimethyl pentanediol-1,3-diisobutyrate	TPR													
2,2,4-Trimethyl-3-pentanol-1-isobutyrate														
Tripropylene, SEE PROPYLENE TRIMER	TMP													
Tripropylene Glycol														
Tripropylene Glycol Methyl Ether	TGC													
Trixylenyl Phosphate	TGM													
Turpentine	TRP													
Turpentine substitute (White spirit), SEE WHITE SPIRIT (LOW (15-20%))	TPT													
Undecanol														
Undecene (1-)														
Undecyl alcohol	UDC	5,000	5005	5038	28288	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
Undecylbenzene	UND	5,000	5001	5009	28122	1.635	*****	86.0	*****	0.0	86.0	0.046	1.68	OK
Vinyl Acetate-fumerate Copolymer	UDB													
Waxes:														
WAXES: Candelilla	WAX													
WAXES: Carnauba														
WAXES: Paraffin	WAX,													
WAXES: Petroleum	WAX,													
White spirit, SEE WHITE SPIRIT (LOW (15-20%) AROMATIC)														
White spirit (low (15 - 20%) aromatic)														
Wine, SEE ALCOHOLIC BEVERAGES, N.O.S.	WSL													

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE III: MAX PRESSURE @ REMOTE TANK FOR
"VGR" * MAX ALLOWABLE LIQUID TRANSFER RATE

BARGES: C9706: CONOCO, INC.; E344													
***** MAX ALLOWABLE LIQUID TRANSFER RATE *****													
CARGO	C	MAX	VAPOR-			PIPE SECT I: LOSS		PIPE SECT II: LOSS		PRESS		DRO	
	H	LIQUID	AIR			FM REMOTE TK TO PV		FM REMOTE TK TO PV		THRU		PIP'G	
	R	TRANSF	MIX	REQUIRED AIR	PRESS					TANK		PRESS	
	I	RATE	FLOW	EQUIVALENT	ACROSS	TOTAL		TOTAL		* REMOTE		@	
	S	(MLTR)	RATE		PV	LOSS		LOSS		TANK		TANK	
		Q1	Qv-a	Qa	VALVE	HtotI		HtotII		Wv-a,11		PV +	
		(10)	(11)	(12)	PV	(FT)		(FT)		* Htot		Ploss	
	(BBL/	(BBL/	(BBL/	(FT^3/						Ploss	Ptk	MDWP	
	HR)	HR)	HR)	HR)	(PSI)					(PSI)	(PSI)		

Wool grease	***												
Xylenes (ortho-, meta-, para-)													
XYLENE (M-)	XLX	5,000	5051	5258	29523	1.635	*****	87.2	*****	0.0	87.2	0.050	1.68 OK
XYLENE (O-)	XLM	5,000	5051	5258	29523	1.635	*****	87.2	*****	0.0	87.2	0.050	1.68 OK
XYLENE (P-)	XLO	5,000	5040	5203	29212	1.635	*****	87.0	*****	0.0	87.0	0.049	1.68 OK
XYLENOL	XLP	5,000	5051	5258	29523	1.635	*****	87.2	*****	0.0	87.2	0.050	1.68 OK
Zinc Dialkyldithiophosphate	XYL	5,000	5010	5051	28360	1.635	*****	86.2	*****	0.0	86.2	0.046	1.68 OK

CALCULATIONS FOR CAPACITY OF CARGO TANK VENTING SYSTEM

BARGES: C9706: CONOCO, INC.; E344

TABLE III: MAX PRESSURE @ REMOTE TANK FOR
"VGR" * MAX ALLOWABLE LIQUID TRANSFER RATE

CARGO													
C H R I S	MAX VAPOR-		REQUIRED AIR		PRESS ACROSS PV VALVE PV (PSI)	PIPE SECT I: LOSS		PIPE SECT II: LOSS		GRAND TOTAL LOSS Htot= I+II (FT)	PRESS DROP THRU PIP'G REMOTE TANK TO P/V Wv-a, 11 * Htot Ploss (PSI)	PRESS @ TANK REMOTE PV + Ploss Ptk (PSI)	IS Ptk < MDWP
	LIQUID	AIR				FM REMOTE TK TO PV	FM REMOTE TK TO PV						
	TRANSF	MIX	EQUIVALENT										
	RATE	FLOW											
	(MLTR)	RATE											
	Q1	Qv-a	Qa										
	(10)	(11)	(12)	(FT^3/									
(BBL/	(BBL/	(BBL/	HR)										
HR)	HR)	HR)	HR)										
46 CFR SUBCHAPTER D, BUT NOT TABLE 30.25-1													

AROMATIC RESIN OIL 60													
AROMATIC RESIN OIL 80													
AROMATIC RESIN OILS													

999													

CONOCO, INC.

E342, E343

SUMMARY TABLE FOR "GASOLINE"

(VGR = 1.25) (S.G. mix = 2.911)

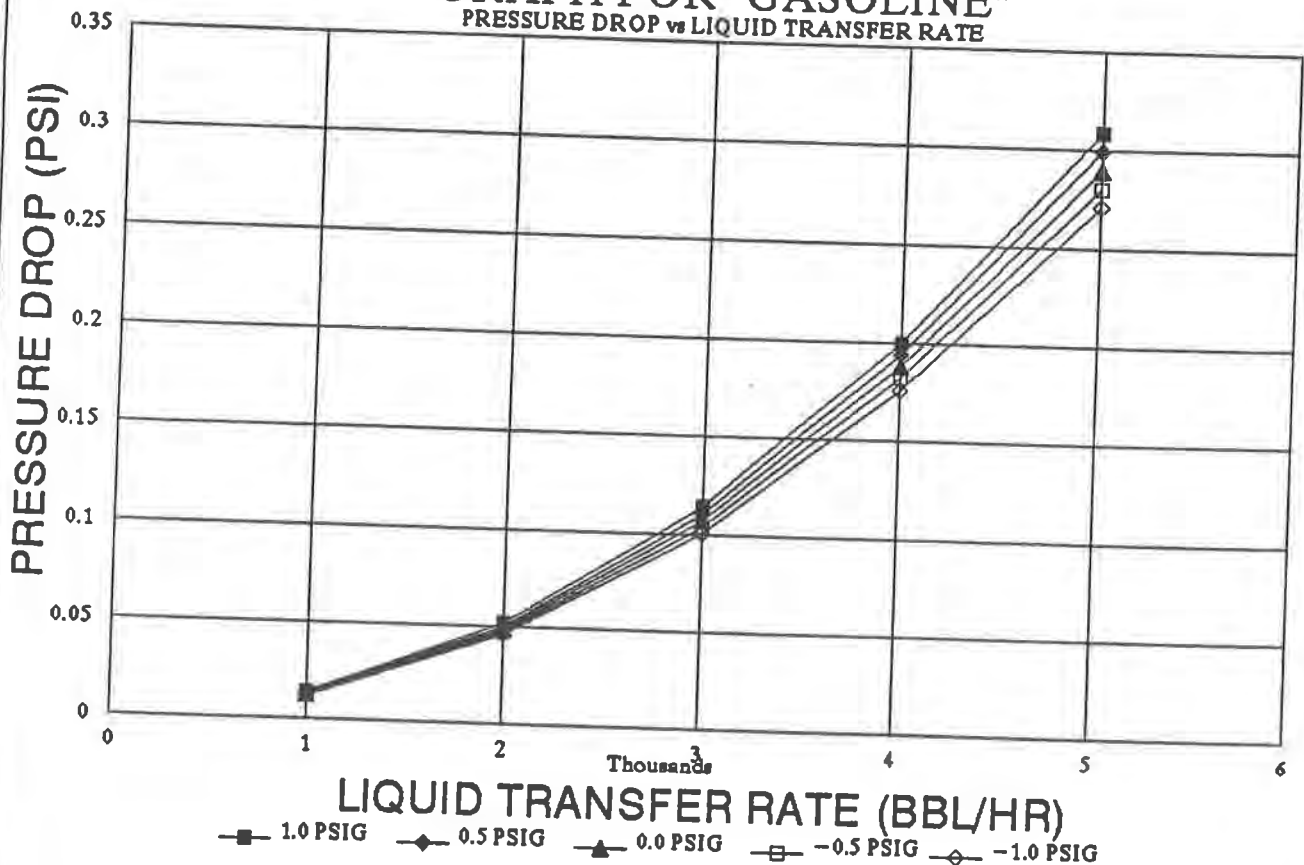
PRESSURE DROP VS LIQUID TRANSFER RATE
FROM MOST REMOTE CARGO TANK TO VESSEL VAPOR CONNECTION
PRESSURE DROP IS BASED ON VAPOR-AIR MIX @ VGR * THE INDICATED LIQUID TRANSFER RATE
(TABULATED DATA IS FOR THE INDICATED PRESSURE AT THE SHORE CONNECTION)

LIQUID TRANSFER RATE				PRESSURE DROP (PSI)				
PERCENT MAX XFER RATE	LIQUID HBL PER HR	LIQUID GAL PER MIN	LIQUID CU FT PER MIN	1.0 PSIG PRESS. @ VAP. CONN.	0.5 PSIG PRESS. @ VAP. CONN.	0.0 PSIG PRESS. @ VAP. CONN.	-0.5 PSIG PRESS. @ VAP. CONN.	-1.0 PSIG PRESS. @ VAP. CONN.
20	1000.0	700.00	83.9	0.0137	0.0133	0.0129	0.0125	0.0121
40	2000.0	1400.00	167.2	0.0521	0.0505	0.0491	0.0474	0.0461
60	3000.0	2100.00	250.7	0.1143	0.1106	0.1074	0.1037	0.1004
80	4000.0	2800.00	334.3	0.1996	0.1936	0.1877	0.1817	0.1758
100 *	5000.0	3500.00	417.9	0.3087	0.2994	0.2900	0.2805	0.2711

* MAXIMUM LIQUID TRANSFER RATE

GRAPH FOR "GASOLINE"

PRESSURE DROP vs LIQUID TRANSFER RATE



PRESSURE DROP IS BASED ON VAPOR-AIR MIX @ VGR * THE INDICATED LIQUID TRANSFER RATE
(TABULATED DATA IS FOR THE INDICATED PRESSURE AT THE SHORE CONNECTION)

(VGR = 1.25) (S.G. mix = 2.911)

DATA FOR VAPOR-AIR MIX PRESSURE DROP VS LIQUID TRANSFER RATE FROM MOST REMOTE CARGO TANK TO VESSEL VAPOR SHORE CONNECTION					20	40	60	80	100
CARGO = "GASOLINE" VGR = 1.25					PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
PRESSURE AT VESSEL VAPOR CONNECTION IS ASSUMED = 1.0 PSIG <--- *					VGR*MAX	VGR*MAX	VGR*MAX	VGR*MAX	VGR*MAX
ITEM	DATA "SOURCE"	SYMBOL	UNITS	TRANSFER	TRANSFER	TRANSFER	TRANSFER	TRANSFER	TRANSFER
ITEM	DATA "SOURCE"	SYMBOL	UNITS	TRANSFER	TRANSFER	TRANSFER	TRANSFER	TRANSFER	TRANSFER
CARGO:									
A "GASOLINE"									
B SPEC GRAV VAP-AIR MIX	INPUT	SG		2.911	2.911	2.911	2.911	2.911	2.911
C SPEC WT VAP-AIR MIX	(SEE NOTE b)	W _s /W _{av}	LBS/CU FT	0.215	0.215	0.215	0.215	0.215	0.215
D ABS VISCOS. VAP-AIR MIX	INPUT (SEE NOTE c)	u	CENTIPOISE	0.0190	0.0190	0.0190	0.0190	0.0190	0.0190
E "	D*2.09E-5	"	# SEC/FT^2	3.97E-07	3.97E-07	3.97E-07	3.97E-07	3.97E-07	3.97E-07
BARGE:									
F VGR*MAX ALLOW TRANS RATE	INPUT	F	BBL/HR	6250	6250	6250	6250	6250	6250
G % OF VGR*MAX ALLOW TRANS RATE	x % * F	F _{cg}	BBL/HR	1250	2500	3750	5000	6250	6250
H "	G*42/60	"	GAL/MIN	875	1750	2625	3500	4375	5250
I "	H/(7.48*60)	"	CU FT/SEC	1.950	3.899	5.849	7.799	9.748	11.698
SHORE CONNECTION									
J PRESSURE @ REQ'D FLOW	INPUT	P2	PSIG	1.0	1.0	1.0	1.0	1.0	1.0
K "	J +14.7	"	PSIA	15.7	15.7	15.7	15.7	15.7	15.7
L "	K*144	"	PSFA	2260.8	2260.8	2260.8	2260.8	2260.8	2260.8
VAP RECOV'Y PIPING: SECTION I									
M INSIDE DIAMETER	INPUT	ID	INCHES	7.981	7.981	7.981	7.981	7.981	7.981
N "	M/12	"	FEET	0.6651	0.6651	0.6651	0.6651	0.6651	0.6651
O INSIDE AREA	3.14159*N^2/4	IA	SQ FT	0.3474	0.3474	0.3474	0.3474	0.3474	0.3474
P ROUGHNESS OF PIPE	INPUT	e	FEET	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015
Q LENGTH	INPUT (SEE NOTE d)	L	FEET	280	280	280	280	280	280
ANALYSIS: SECTION I									
R VELOC. THRU VAP REC PIPING	I/O	V	FT/SEC	5.61	11.22	16.84	22.45	28.06	33.67
S COEFF.: HEAD LOSS, ENTRANCE	INPUT	KE		0.5	0.5	0.5	0.5	0.5	0.5
T COEFF.: HEAD LOSS, BENDS	INPUT (SEE NOTE e)	KB		0.972	0.972	0.972	0.972	0.972	0.972
U NO. OF BENDS	INPUT	N		9	9	9	9	9	9
V COEFF.: HEAD LOSS, VALVE	INPUT	KV		0.65	0.65	0.65	0.65	0.65	0.65
W COEFF.: HEAD LOSS, EXIT	INPUT	KX		0	0	0	0	0	0
X HEAD LOSS: ENTRANCE	S*(R^2/2*32.2)	HE	FT PROD. (GAS)	0.245	0.978	2.201	3.912	6.113	8.314
Y HEAD LOSS: BENDS	U*T*(R^2/2*32.2)	HB	FT PROD. (GAS)	4.279	17.116	38.512	68.465	106.977	145.489
Z HEAD LOSS: VALVE	V*(R^2/2*32.2)	HV	FT PROD. (GAS)	0.318	1.271	2.861	5.086	7.947	10.808
AA HEAD LOSS: EXIT	W*(R^2/2*32.2)	HX	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000	0.000
BB REYNOLDS NO.	R*N*C/E*32.2	R		6.28E+04	1.26E+05	1.88E+05	2.51E+05	3.14E+05	3.77E+05
CC RELATIVE ROUGHNESS	P/N	e/D		0.00023	0.00023	0.00023	0.00023	0.00023	0.00023
DD MOODY DIAG FRICTION FACTOR	INPUT	f		0.02118	0.01892	0.01783	0.01711	0.01670	0.01630
EE HEAD LOSS: PIPE	DD*(Q/N)*(R^2/2*32.2)	HP	FT PROD. (GAS)	4.361	15.579	33.045	56.352	85.949	115.546
FF HEAD LOSS: TOTAL	X+Y+Z+AA+EE	HL	FT PROD. (GAS)	9.203	34.945	76.618	133.816	206.985	281.594
VAP RECOV'Y PIPING: SECTION II									
M INSIDE DIAMETER	INPUT	ID	INCHES	1.0E-14	1.0E-14	1.0E-14	1.0E-14	1.0E-14	1.0E-14
N "	M/12	"	FEET	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
O INSIDE AREA	3.14159*N^2/4	IA	SQ FT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
P ROUGHNESS OF PIPE	INPUT	e	FEET	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015
Q LENGTH	INPUT (SEE NOTE d)	L	FEET	0	0	0	0	0	0
ANALYSIS: SECTION II									
R VELOC. THRU VAP REC PIPING	I/O	V	FT/SEC	*****	*****	*****	*****	*****	*****
S COEFF.: HEAD LOSS, ENTRANCE	INPUT	KE		0	0	0	0	0	0
T COEFF.: HEAD LOSS, PER BEND	INPUT (SEE NOTE e)	KB		0.000	0.000	0.000	0.000	0.000	0.000
U NO. OF BENDS	INPUT	N		1.0E-11	1.0E-11	1.0E-11	1.0E-11	1.0E-11	1.0E-11
V COEFF.: HEAD LOSS, VALVE	INPUT	KV		0	0	0	0	0	0
W COEFF.: HEAD LOSS, EXIT	INPUT	KX		0	0	0	0	0	0
X HEAD LOSS: ENTRANCE	S*(R^2/2*32.2)	HE	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000	0.000
Y HEAD LOSS: BENDS	U*T*(R^2/2*32.2)	HB	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000	0.000
Z HEAD LOSS: VALVE	V*(R^2/2*32.2)	HV	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000	0.000
AA HEAD LOSS: EXIT	W*(R^2/2*32.2)	HX	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000	0.000
BB REYNOLDS NO.	R*N*C/E*32.2	R		N/A	N/A	N/A	N/A	N/A	N/A
CC RELATIVE ROUGHNESS	P/N	e/D		1.8E+11	1.8E+11	1.8E+11	1.8E+11	1.8E+11	1.8E+11
DD MOODY DIAG FRICTION FACTOR	INPUT	f		N/A	N/A	N/A	N/A	N/A	N/A
EE HEAD LOSS: PIPE	DD*(Q/N)*(R^2/2*32.2)	HP	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000	0.000
FF HEAD LOSS: TOTAL	X+Y+Z+AA+EE	HL	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000	0.000
FFto HEAD LOSS: GRAND TOTAL	FF(I) + FF(II)	HLtot	FT PROD. (GAS)	9.203	34.945	76.618	133.816	206.985	281.594
GG PRESSURE @ TANK	(SEE NOTE f)	P1	PSFA	2262.78	2268.31	2277.26	2289.54	2305.26	2320.98
HH "	GG/144	"	PSIA	15.71	15.75	15.81	15.90	16.01	16.12
II "	HH-14.7	"	PSIG	1.01	1.05	1.11	1.20	1.31	1.41
JJ (P1 - P2) / P1	(HH-K) / HH			0.1%	0.3%	0.7%	1.3%	1.9%	2.5%
KK (P1 - P2) / P1 < 10% ??				YES	YES	YES	YES	YES	YES
PP (P1 - P2)	(II - J)		PSI	0.0137	0.0521	0.1143	0.1996	0.3087	0.4178

DATA FOR VAPOR-AIR MIX PRESSURE DROP VS LIQUID TRANSFER RATE
FROM MOST REMOTE CARGO TANK TO VESSEL VAPOR SHORE CONNECTION

PRESSURE AT VESSEL VAPOR CONNECTION IS ASSUMED -					20	40	60	80	100
CARGO - "GASOLINE" VGR = 1.25					PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
ITEM	DATA "SOURCE"	SYMBOL	UNITS	0.5 PSIG	VGR*MAX	VGR*MAX	VGR*MAX	VGR*MAX	VGR*MAX
EP	ITEM	SYMBOL	UNITS	0.5 PSIG	TRANSFER	TRANSFER	TRANSFER	TRANSFER	TRANSFER
					RATE	RATE	RATE	RATE	RATE
A	CARGO:								
B	"GASOLINE"								
C	SPEC GRAV VAP-AIR MIX	INPUT	SG		2.911	2.911	2.911	2.911	2.911
D	SPEC WT VAP-AIR MIX	(SEE NOTE b)	W _s /W _{av}	LBS/CU FT	0.208	0.208	0.208	0.208	0.208
E	ABS VISCOS. VAP-AIR MIX	INPUT (SEE NOTE c)	u	CENTIPOISE	0.0190	0.0190	0.0190	0.0190	0.0190
F	BARGE:	D*2.09E-5	"	# SEC/FT^2	3.97E-07	3.97E-07	3.97E-07	3.97E-07	3.97E-07
G	VGR*MAX ALLOW TRANS RATE	INPUT	F	BBL/HR	6250	6250	6250	6250	6250
H	% OF VGR*MAX ALLOW TRANS RATE	x % * F	Fcg	BBL/HR	1250	2500	3750	5000	6250
I		G*42/60	"	GAL/MIN	875	1750	2625	3500	4375
J	SHORE CONNECTION	H/(7.48*60)	"	CU FT/SEC	1.950	3.899	5.849	7.799	9.748
K	SETTING	INPUT	P2	PSIG	0.5	0.5	0.5	0.5	0.5
L		J +14.7	"	PSIA	15.2	15.2	15.2	15.2	15.2
M	VAP RECOV'Y PIPING: SECTION I	K*144	"	PSFA	2188.8	2188.8	2188.8	2188.8	2188.8
N	INSIDE DIAMETER	INPUT	ID	INCHES	7.981	7.981	7.981	7.981	7.981
O		M/12	"	FEET	0.6651	0.6651	0.6651	0.6651	0.6651
P	INSIDE AREA	3.14159*N^2/4	IA	SQ FT	0.3474	0.3474	0.3474	0.3474	0.3474
Q	ROUGHNESS OF PIPE	INPUT	e	FEET	0.00015	0.00015	0.00015	0.00015	0.00015
R	LENGTH	INPUT (SEE NOTE d)	L	FEET	280	280	280	280	280
S	ANALYSIS: SECTION I								
T	VELOC. THRU VAP REC PIPING	I/O	V	FT/SEC	5.61	11.22	16.84	22.45	28.06
U	COEFF.: HEAD LOSS, ENTRANCE	INPUT	KE		0.5	0.5	0.5	0.5	0.5
V	COEFF.: HEAD LOSS, BENDS	INPUT (SEE NOTE e)	KB		0.972	0.972	0.972	0.972	0.972
W	NO. OF BENDS	INPUT	N		9	9	9	9	9
X	COEFF.: HEAD LOSS, VALVE	INPUT	KV		0.65	0.65	0.65	0.65	0.65
Y	COEFF.: HEAD LOSS, EXIT	INPUT	KX		0	0	0	0	0
Z	HEAD LOSS: ENTRANCE	S*(R^2/2*32.2)	HE	FT PROD. (GAS)	0.245	0.978	2.201	3.912	6.113
AA	HEAD LOSS: BENDS	U*T*(R^2/2*32.2)	HB	FT PROD. (GAS)	4.279	17.116	38.512	68.465	106.977
AB	HEAD LOSS: VALVE	V*(R^2/2*32.2)	HV	FT PROD. (GAS)	0.318	1.271	2.861	5.086	7.947
AC	HEAD LOSS: EXIT	W*(R^2/2*32.2)	HW	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
AD	REYNOLDS NO.	R*N*C/E*32.2	R		6.08E+04	1.22E+05	1.82E+05	2.43E+05	3.04E+05
AE	RELATIVE ROUGHNESS	P/N	e/D		0.000226	0.000226	0.000226	0.000226	0.000226
AF	MOODY DIAG FRICTION FACTOR	INPUT	f		0.02131	0.01892	0.01783	0.01719	0.01676
AG	HEAD LOSS: PIPE	DD*(Q/N)*(R^2/2*32.2)	HP	FT PROD. (GAS)	4.388	15.579	33.045	56.627	86.252
AH	HEAD LOSS: TOTAL	X+Y+Z+AA+EE	HL	FT PROD. (GAS)	9.230	34.945	76.618	134.090	207.289
AI	VAP RECOV'Y PIPING: SECTION II								
AJ	INSIDE DIAMETER	INPUT	ID	INCHES	1.0E-14	1.0E-14	1.0E-14	1.0E-14	1.0E-14
AK		M/12	"	FEET	0.0000	0.0000	0.0000	0.0000	0.0000
AL	INSIDE AREA	3.14159*N^2/4	IA	SQ FT	0.0000	0.0000	0.0000	0.0000	0.0000
AM	ROUGHNESS OF PIPE	INPUT	e	FEET	0.00015	0.00015	0.00015	0.00015	0.00015
AN	LENGTH	INPUT (SEE NOTE d)	L	FEET	0	0	0	0	0
AO	ANALYSIS: SECTION II								
AP	VELOC. THRU VAP REC PIPING	I/O	V	FT/SEC	*****	*****	*****	*****	*****
AQ	COEFF.: HEAD LOSS, ENTRANCE	INPUT	KE		0	0	0	0	0
AR	COEFF.: HEAD LOSS, PER BEND	INPUT (SEE NOTE e)	KB		0.000	0.000	0.000	0.000	0.000
AS	NO. OF BENDS	INPUT	N		1.0E-11	1.0E-11	1.0E-11	1.0E-11	1.0E-11
AT	COEFF.: HEAD LOSS, VALVE	INPUT	KV		0	0	0	0	0
AU	COEFF.: HEAD LOSS, EXIT	INPUT	KX		0	0	0	0	0
AV	HEAD LOSS: ENTRANCE	S*(R^2/2*32.2)	HE	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
AW	HEAD LOSS: BENDS	U*T*(R^2/2*32.2)	HB	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
AX	HEAD LOSS: VALVE	V*(R^2/2*32.2)	HV	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
AY	HEAD LOSS: EXIT	W*(R^2/2*32.2)	HW	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
AZ	REYNOLDS NO.	R*N*C/E*32.2	R		N/A	N/A	N/A	N/A	N/A
BA	RELATIVE ROUGHNESS	P/N	e/D		1.8E+11	1.8E+11	1.8E+11	1.8E+11	1.8E+11
BB	MOODY DIAG FRICTION FACTOR	INPUT	f		N/A	N/A	N/A	N/A	N/A
BC	HEAD LOSS: PIPE	DD*(Q/N)*(R^2/2*32.2)	HP	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
BD	HEAD LOSS: TOTAL	X+Y+Z+AA+EE	HL	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
BE	HEAD LOSS: GRAND TOTAL	FF(I) + FF(II)	HLtot	FT PROD. (GAS)	9.230	34.945	76.618	134.090	207.289
BF	PRESSURE @ TANK	(SEE NOTE f)	P1	PSFA	2190.72	2196.07	2204.73	2216.68	2231.91
BG		GG/144	"	PSIA	15.21	15.25	15.31	15.39	15.50
BH		HH-14.7	"	PSIG	0.51	0.55	0.61	0.69	0.80
BI		(HH-K) /HH	"		0.1%	0.3%	0.7%	1.3%	1.9%
BJ	(P1 - P2) / P1				YES	YES	YES	YES	YES
BK	(P1 - P2) / P1 < 10% ??				0.0133	0.0505	0.1106	0.1936	0.2994
BL	(P1-P2)	(II-J)		PSI					

DATA FOR VAPOR-AIR MIX PRESSURE DROP VS LIQUID TRANSFER RATE
FROM MOST REMOTE CARGO TANK TO VESSEL VAPOR SHORE CONNECTION

CARGO = "GASOLINE"

VGR =

0.0 PSIG

1.25

PRESSURE AT VESSEL VAPOR CONNECTION IS ASSUMED =

ITEM	DATA "SOURCE"	SYMBOL	UNITS	20 PERCENT VGR*MAX TRANSFER RATE	40 PERCENT VGR*MAX TRANSFER RATE	60 PERCENT VGR*MAX TRANSFER RATE	80 PERCENT VGR*MAX TRANSFER RATE	100 PERCENT VGR*MAX TRANSFER RATE
CARGO:								
"GASOLINE"								
SPEC GRAV VAP-AIR MIX	INPUT	SG		2.911	2.911	2.911	2.911	2.911
SPEC WT VAP-AIR MIX	(SEE NOTE b)	W _s /W _{av}	LBS/CU FT	0.201	0.201	0.201	0.201	0.201
ABS VISCOS. VAP-AIR MIX	INPUT (SEE NOTE c)	u	CENTIPOISE	0.0190	0.0190	0.0190	0.0190	0.0190
"	D*2.09E-5	"	# SEC/FT^2	3.97E-07	3.97E-07	3.97E-07	3.97E-07	3.97E-07
BARGE:								
VGR*MAX ALLOW TRANS RATE	INPUT	P	BBL/HR	6250	6250	6250	6250	6250
% OF VGR*MAX ALLOW TRANS RATE	x % * P	F _{cg}	BBL/HR	1250	2500	3750	5000	6250
"	G*42/60	"	GAL/MIN	875	1750	2625	3500	4375
"	H/(7.48*60)	"	CU FT/SEC	1.950	3.899	5.849	7.799	9.748
SHORE CONNECTION								
SETTING	INPUT	P2	PSIG	0.0	0.0	0.0	0.0	0.0
"	J +14.7	"	PSIA	14.7	14.7	14.7	14.7	14.7
"	K*144	"	PSFA	2116.8	2116.8	2116.8	2116.8	2116.8
VAP RECOV'Y PIPING: SECTION I								
INSIDE DIAMETER	INPUT	ID	INCHES	7.981	7.981	7.981	7.981	7.981
"	M/12	"	FEET	0.6651	0.6651	0.6651	0.6651	0.6651
INSIDE AREA	3.14159*N^2/4	IA	SQ FT	0.3474	0.3474	0.3474	0.3474	0.3474
ROUGHNESS OF PIPE	INPUT	e	FEET	0.00015	0.00015	0.00015	0.00015	0.00015
LENGTH	INPUT (SEE NOTE d)	L	FEET	280	280	280	280	280
ANALYSIS: SECTION I								
VELOC. THRU VAP REC PIPING	I/O	V	FT/SEC	5.61	11.22	16.84	22.45	28.06
COEFF.: HEAD LOSS, ENTRANCE	INPUT	KE		0.5	0.5	0.5	0.5	0.5
COEFF.: HEAD LOSS, BENDS	INPUT (SEE NOTE e)	KB		0.972	0.972	0.972	0.972	0.972
NO. OF BENDS	INPUT	N		9	9	9	9	9
COEFF.: HEAD LOSS, VALVE	INPUT	KV		0.65	0.65	0.65	0.65	0.65
COEFF.: HEAD LOSS, EXIT	INPUT	KX		0	0	0	0	0
HEAD LOSS: ENTRANCE	S*(R^2/2*32.2)	HE	FT PROD. (GAS)	0.245	0.978	2.201	3.912	6.113
HEAD LOSS: BENDS	U*T*(R^2/2*32.2)	HB	FT PROD. (GAS)	4.279	17.116	38.512	68.465	106.977
HEAD LOSS: VALVE	V*(R^2/2*32.2)	HV	FT PROD. (GAS)	0.318	1.271	2.861	5.086	7.947
HEAD LOSS: EXIT	W*(R^2/2*32.2)	HX	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
REYNOLDS NO.	R*N*C/E*32.2	R		5.88E+04	1.18E+05	1.76E+05	2.35E+05	2.94E+05
RELATIVE ROUGHNESS	P/N	e/D		0.000226	0.000226	0.000226	0.000226	0.000226
MOODY DIAG FRICTION FACTOR	INPUT	f		0.02145	0.01918	0.01797	0.01728	0.01682
HEAD LOSS: PIPE	DD*(Q/N)*(R^2/2*32.2)	HP	FT PROD. (GAS)	4.416	15.795	33.304	56.920	86.572
HEAD LOSS: TOTAL	X+Y+Z+AA+EE	HL	FT PROD. (GAS)	9.258	35.161	76.877	134.383	207.609
VAP RECOV'Y PIPING: SECTION II								
INSIDE DIAMETER	INPUT	ID	INCHES	1.0E-14	1.0E-14	1.0E-14	1.0E-14	1.0E-14
"	M/12	"	FEET	0.0000	0.0000	0.0000	0.0000	0.0000
INSIDE AREA	3.14159*N^2/4	IA	SQ FT	0.0000	0.0000	0.0000	0.0000	0.0000
ROUGHNESS OF PIPE	INPUT	e	FEET	0.00015	0.00015	0.00015	0.00015	0.00015
LENGTH	INPUT (SEE NOTE d)	L	FEET	0	0	0	0	0
ANALYSIS: SECTION II								
VELOC. THRU VAP REC PIPING	I/O	V	FT/SEC	*****	*****	*****	*****	*****
COEFF.: HEAD LOSS, ENTRANCE	INPUT	KE		0	0	0	0	0
COEFF.: HEAD LOSS, PER BEND	INPUT (SEE NOTE e)	KB		0.000	0.000	0.000	0.000	0.000
NO. OF BENDS	INPUT	N		1.0E-11	1.0E-11	1.0E-11	1.0E-11	1.0E-11
COEFF.: HEAD LOSS, VALVE	INPUT	KV		0	0	0	0	0
COEFF.: HEAD LOSS, EXIT	INPUT	KX		0	0	0	0	0
HEAD LOSS: ENTRANCE	S*(R^2/2*32.2)	HE	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
HEAD LOSS: BENDS	U*T*(R^2/2*32.2)	HB	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
HEAD LOSS: VALVE	V*(R^2/2*32.2)	HV	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
HEAD LOSS: EXIT	W*(R^2/2*32.2)	HX	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
REYNOLDS NO.	R*N*C/E*32.2	R		N/A	N/A	N/A	N/A	N/A
RELATIVE ROUGHNESS	P/N	e/D		1.8E+11	1.8E+11	1.8E+11	1.8E+11	1.8E+11
MOODY DIAG FRICTION FACTOR	INPUT	f		N/A	N/A	N/A	N/A	N/A
HEAD LOSS: PIPE	DD*(Q/N)*(R^2/2*32.2)	HP	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
HEAD LOSS: TOTAL	X+Y+Z+AA+EE	HL	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
HEAD LOSS: GRAND TOTAL	FF(I) + FF(II)	HLtot	FT PROD. (GAS)	9.258	35.161	76.877	134.383	207.609
PRESSURE @ TANK	(SEE NOTE f)	P1	PSFA	2118.66	2123.87	2132.26	2143.83	2158.55
"	GG/144	"	PSIA	14.71	14.75	14.81	14.89	14.99
"	HH-14.7	"	PSIG	0.01	0.05	0.11	0.19	0.29
(P1 - P2) / P1	(HH-K) / HH	"		0.1%	0.3%	0.7%	1.3%	1.9%
(P1 - P2) / P1 < 10% ??				YES	YES	YES	YES	YES
(P1-P2)	(II-J)		PSI	0.0129	0.0491	0.1074	0.1877	0.2900

DATA FOR VAPOR-AIR MIX PRESSURE DROP VS LIQUID TRANSFER RATE
FROM MOST REMOTE CARGO TANK TO VESSEL VAPOR SHORE CONNECTION

					20	40	60	80	100
					PERCENT	PERCENT	PERCENT	PERCENT	PERCENT
					VGR*MAX	VGR*MAX	VGR*MAX	VGR*MAX	VGR*MAX
					TRANSFER	TRANSFER	TRANSFER	TRANSFER	TRANSFER
					RATE	RATE	RATE	RATE	RATE
					-----	-----	-----	-----	-----
TEP	ITEM	DATA "SOURCE"	SYMBOL	UNITS					
CARGO:									
A	"GASOLINE"								
B	SPEC GRAV VAP-AIR MIX	INPUT	SG		2.911	2.911	2.911	2.911	2.911
C	SPEC WT VAP-AIR MIX	(SEE NOTE b)	W _s /W _{sv}	LBS/CU FT	0.194	0.194	0.194	0.194	0.194
D	ABS VISCOS. VAP-AIR MIX	INPUT (SEE NOTE c)	u	CENTIPOISE	0.0190	0.0190	0.0190	0.0190	0.0190
E	"	D*2.09E-5	"	# SEC/FT^2	3.97E-07	3.97E-07	3.97E-07	3.97E-07	3.97E-07
BARGE:									
F	VGR*MAX ALLOW TRANS RATE	INPUT	F	BBL/HR	6250	6250	6250	6250	6250
G	% OF VGR*MAX ALLOW TRANS RATE	x % * F	Fcg	BBL/HR	1250	2500	3750	5000	6250
H	"	G*42/60	"	GAL/MIN	875	1750	2625	3500	4375
I	"	H/(7.48*60)	"	CU FT/SEC	1.950	3.899	5.849	7.799	9.748
SHORE CONNECTION									
J	SETTING	INPUT	P2	PSIG	-0.5	-0.5	-0.5	-0.5	-0.5
K	"	J +14.7	"	PSIA	14.2	14.2	14.2	14.2	14.2
L	"	K*144	"	PSFA	2044.8	2044.8	2044.8	2044.8	2044.8
VAP RECOV'Y PIPING: SECTION I									
M	INSIDE DIAMETER	INPUT	ID	INCHES	7.981	7.981	7.981	7.981	7.981
N	"	M/12	"	FEET	0.6651	0.6651	0.6651	0.6651	0.6651
O	INSIDE AREA	3.14159*N^2/4	IA	SQ FT	0.3474	0.3474	0.3474	0.3474	0.3474
P	ROUGHNESS OF PIPE	INPUT	e	FEET	0.00015	0.00015	0.00015	0.00015	0.00015
Q	LENGTH	INPUT (SEE NOTE d)	L	FEET	280	280	280	280	280
ANALYSIS: SECTION I									
R	VELOC. THRU VAP REC PIPING	I/O	V	FT/SEC	5.61	11.22	16.84	22.45	28.06
S	COEFF.: HEAD LOSS, ENTRANCE	INPUT	KE		0.5	0.5	0.5	0.5	0.5
T	COEFF.: HEAD LOSS, BENDS	INPUT (SEE NOTE e)	KB		0.972	0.972	0.972	0.972	0.972
U	NO. OF BENDS	INPUT	N		9	9	9	9	9
V	COEFF.: HEAD LOSS, VALVE	INPUT	KV		0.65	0.65	0.65	0.65	0.65
W	COEFF.: HEAD LOSS, EXIT	INPUT	KX		0	0	0	0	0
X	HEAD LOSS: ENTRANCE	S*(R^2/2*32.2)	HE	FT PROD. (GAS)	0.245	0.978	2.201	3.912	6.113
Y	HEAD LOSS: BENDS	U*T*(R^2/2*32.2)	HB	FT PROD. (GAS)	4.279	17.116	38.512	68.465	106.977
Z	HEAD LOSS: VALVE	V*(R^2/2*32.2)	HV	FT PROD. (GAS)	0.318	1.271	2.861	5.086	7.947
AA	HEAD LOSS: EXIT	W*(R^2/2*32.2)	HX	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
BB	REYNOLDS NO.	R*N*C/E*32.2	R		5.68E+04	1.14E+05	1.70E+05	2.27E+05	2.84E+05
CC	RELATIVE ROUGHNESS	P/N	e/D		0.000226	0.000226	0.000226	0.000226	0.000226
DD	MOODY DIAG FRICTION FACTOR	INPUT	f		0.02159	0.01918	0.01797	0.01737	0.01689
EE	HEAD LOSS: PIPE	DD*(Q/N)*(R^2/2*32.2)	HP	FT PROD. (GAS)	4.446	15.795	33.304	57.233	86.910
FF	HEAD LOSS: TOTAL	X+Y+Z+AA+EE	HL	FT PROD. (GAS)	9.287	35.161	76.877	134.697	207.947
VAP RECOV'Y PIPING: SECTION II									
M	INSIDE DIAMETER	INPUT	ID	INCHES	1.0E-14	1.0E-14	1.0E-14	1.0E-14	1.0E-14
N	"	M/12	"	FEET	0.0000	0.0000	0.0000	0.0000	0.0000
O	INSIDE AREA	3.14159*N^2/4	IA	SQ FT	0.0000	0.0000	0.0000	0.0000	0.0000
P	ROUGHNESS OF PIPE	INPUT	e	FEET	0.00015	0.00015	0.00015	0.00015	0.00015
Q	LENGTH	INPUT (SEE NOTE d)	L	FEET	0	0	0	0	0
ANALYSIS: SECTION II									
R	VELOC. THRU VAP REC PIPING	I/O	V	FT/SEC	*****	*****	*****	*****	*****
S	COEFF.: HEAD LOSS, ENTRANCE	INPUT	KE		0	0	0	0	0
T	COEFF.: HEAD LOSS, PER BEND	INPUT (SEE NOTE e)	KB		0.000	0.000	0.000	0.000	0.000
U	NO. OF BENDS	INPUT	N		1.0E-11	1.0E-11	1.0E-11	1.0E-11	1.0E-11
V	COEFF.: HEAD LOSS, VALVE	INPUT	KV		0	0	0	0	0
W	COEFF.: HEAD LOSS, EXIT	INPUT	KX		0	0	0	0	0
X	HEAD LOSS: ENTRANCE	S*(R^2/2*32.2)	HE	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
Y	HEAD LOSS: BENDS	U*T*(R^2/2*32.2)	HB	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
Z	HEAD LOSS: VALVE	V*(R^2/2*32.2)	HV	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
AA	HEAD LOSS: EXIT	W*(R^2/2*32.2)	HX	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
BB	REYNOLDS NO.	R*N*C/E*32.2	R		N/A	N/A	N/A	N/A	N/A
CC	RELATIVE ROUGHNESS	P/N	e/D		1.8E+11	1.8E+11	1.8E+11	1.8E+11	1.8E+11
DD	MOODY DIAG FRICTION FACTOR	INPUT	f		N/A	N/A	N/A	N/A	N/A
EE	HEAD LOSS: PIPE	DD*(Q/N)*(R^2/2*32.2)	HP	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
FF	HEAD LOSS: TOTAL	X+Y+Z+AA+EE	HL	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
FFto	HEAD LOSS: GRAND TOTAL	FF(I) + FF(II)	HLtot	FT PROD. (GAS)	9.287	35.161	76.877	134.697	207.947
GG	PRESSURE @ TANK	(SEE NOTE f)	P1	PSFA	2046.60	2051.63	2059.74	2070.97	2085.20
HH	"	GG/144	"	PSIA	14.21	14.25	14.30	14.38	14.48
II	"	HH-14.7	"	PSIG	-0.49	-0.45	-0.40	-0.32	-0.22
JJ	(P1 - P2) / P1	(HH-K) / HH	"		0.1%	0.3%	0.7%	1.3%	1.9%
KK	(P1 - P2) / P1 < 10% ??				YES	YES	YES	YES	YES
PP	(P1 - P2)	(II - J)		PSI	0.0125	0.0474	0.1037	0.1817	0.2805

DATA FOR VAPOR-AIR MIX PRESSURE DROP VS LIQUID TRANSFER RATE
FROM MOST REMOTE CARGO TANK TO VESSEL VAPOR SHORE CONNECTION

CARGO = "GASOLINE"

VGR =

1.25

PRESSURE AT VESSEL VAPOR CONNECTION IS ASSUMED =

-1.0 PSIG

FEF	ITEM	DATA "SOURCE"	SYMBOL	UNITS	20 PERCENT VGR*MAX TRANSFER RATE	40 PERCENT VGR*MAX TRANSFER RATE	60 PERCENT VGR*MAX TRANSFER RATE	80 PERCENT VGR*MAX TRANSFER RATE	100 PERCENT VGR*MAX TRANSFER RATE
	CARGO								
A	"GASOLINE"								
B	SPEC GRAV VAP-AIR MIX	INPUT	SG		2.911	2.911	2.911	2.911	2.911
C	SPEC WT VAP-AIR MIX	(SEE NOTE b)	W _s /W _{av}	LBS/CU FT	0.187	0.187	0.187	0.187	0.187
D	ABS VISCOS. VAP-AIR MIX	INPUT (SEE NOTE c)	u	CENTIPOISE	0.0190	0.0190	0.0190	0.0190	0.0190
E	"	D*2.09E-5	"	# SEC/FT ²	3.97E-07	3.97E-07	3.97E-07	3.97E-07	3.97E-07
	BARGE:								
F	VGR*MAX ALLOW TRANS RATE	INPUT	F	BBL/HR	6250	6250	6250	6250	6250
G	% OF VGR*MAX ALLOW TRANS RATE	x % * F	Fcg	BBL/HR	1250	2500	3750	5000	6250
H	"	G*42/60	"	GAL/MIN	875	1750	2625	3500	4375
I	"	H/(7.48*60)	"	CU FT/SEC	1.950	3.899	5.849	7.799	9.748
	SHORE CONNECTION								
J	SETTING	INPUT	P2	PSIG	-1.0	-1.0	-1.0	-1.0	-1.0
K	"	J +14.7	"	PSIA	13.7	13.7	13.7	13.7	13.7
L	"	K*144	"	PSFA	1972.8	1972.8	1972.8	1972.8	1972.8
	VAP RECOV'Y PIPING: SECTION I								
M	INSIDE DIAMETER	INPUT	ID	INCHES	7.981	7.981	7.981	7.981	7.981
N	"	M/12	"	FEET	0.6651	0.6651	0.6651	0.6651	0.6651
O	INSIDE AREA	3.14159*N ² /4	IA	SQ FT	0.3474	0.3474	0.3474	0.3474	0.3474
P	ROUGHNESS OF PIPE	INPUT	e	FEET	0.00015	0.00015	0.00015	0.00015	0.00015
Q	LENGTH	INPUT (SEE NOTE d)	L	FEET	280	280	280	280	280
	ANALYSIS: SECTION I								
R	VELOC. THRU VAP REC PIPING	I/O	V	FT/SEC	5.61	11.22	16.84	22.45	28.06
S	COEFF.: HEAD LOSS, ENTRANCE	INPUT	KE		0.5	0.5	0.5	0.5	0.5
T	COEFF.: HEAD LOSS, BENDS	INPUT (SEE NOTE e)	KB		0.972	0.972	0.972	0.972	0.972
U	NO. OF BENDS	INPUT	N		9	9	9	9	9
V	COEFF.: HEAD LOSS, VALVE	INPUT	KV		0.65	0.65	0.65	0.65	0.65
W	COEFF.: HEAD LOSS, EXIT	INPUT	KX		0	0	0	0	0
X	HEAD LOSS: ENTRANCE	S*(R ² /2*32.2)	HE	FT PROD. (GAS)	0.245	0.978	2.201	3.912	6.113
Y	HEAD LOSS: BENDS	U*T*(R ² /2*32.2)	HB	FT PROD. (GAS)	4.279	17.116	38.512	68.465	106.977
Z	HEAD LOSS: VALVE	V*(R ² /2*32.2)	HV	FT PROD. (GAS)	0.318	1.271	2.861	5.086	7.947
AA	HEAD LOSS: EXIT	W*(R ² /2*32.2)	HX	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
BB	REYNOLDS NO.	R*N*C/E*32.2	R		5.48E+04	1.10E+05	1.64E+05	2.19E+05	2.74E+05
CC	RELATIVE ROUGHNESS	P/N	e/D		0.000226	0.000226	0.000226	0.000226	0.000226
DD	MOODY DIAG FRICTION FACTOR	INPUT	f		0.02174	0.01948	0.01813	0.01748	0.01695
EE	HEAD LOSS: PIPE	DD*(Q/N)*(R ² /2*32.2)	HP	FT PROD. (GAS)	4.477	16.041	33.587	57.570	87.268
FF	HEAD LOSS: TOTAL	X+Y+Z+AA+EE	HL	FT PROD. (GAS)	9.318	35.407	77.160	135.033	208.305
	VAP RECOV'Y PIPING: SECTION II								
M	INSIDE DIAMETER	INPUT	ID	INCHES	1.0E-14	1.0E-14	1.0E-14	1.0E-14	1.0E-14
N	"	M/12	"	FEET	0.0000	0.0000	0.0000	0.0000	0.0000
O	INSIDE AREA	3.14159*N ² /4	IA	SQ FT	0.0000	0.0000	0.0000	0.0000	0.0000
P	ROUGHNESS OF PIPE	INPUT	e	FEET	0.00015	0.00015	0.00015	0.00015	0.00015
Q	LENGTH	INPUT (SEE NOTE d)	L	FEET	0	0	0	0	0
	ANALYSIS: SECTION II								
R	VELOC. THRU VAP REC PIPING	I/O	V	FT/SEC	*****	*****	*****	*****	*****
S	COEFF.: HEAD LOSS, ENTRANCE	INPUT	KE		0	0	0	0	0
T	COEFF.: HEAD LOSS, PER BEND	INPUT (SEE NOTE e)	KB		0.000	0.000	0.000	0.000	0.000
U	NO. OF BENDS	INPUT	N		1.0E-11	1.0E-11	1.0E-11	1.0E-11	1.0E-11
V	COEFF.: HEAD LOSS, VALVE	INPUT	KV		0	0	0	0	0
W	COEFF.: HEAD LOSS, EXIT	INPUT	KX		0	0	0	0	0
X	HEAD LOSS: ENTRANCE	S*(R ² /2*32.2)	HE	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
Y	HEAD LOSS: BENDS	U*T*(R ² /2*32.2)	HB	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
Z	HEAD LOSS: VALVE	V*(R ² /2*32.2)	HV	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
AA	HEAD LOSS: EXIT	W*(R ² /2*32.2)	HX	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
BB	REYNOLDS NO.	R*N*C/E*32.2	R		N/A	N/A	N/A	N/A	N/A
CC	RELATIVE ROUGHNESS	P/N	e/D		1.8E+11	1.8E+11	1.8E+11	1.8E+11	1.8E+11
DD	MOODY DIAG FRICTION FACTOR	INPUT	f		N/A	N/A	N/A	N/A	N/A
EE	HEAD LOSS: PIPE	DD*(Q/N)*(R ² /2*32.2)	HP	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
FF	HEAD LOSS: TOTAL	X+Y+Z+AA+EE	HL	FT PROD. (GAS)	0.000	0.000	0.000	0.000	0.000
FFto	HEAD LOSS: GRAND TOTAL	FF(I) + FF(II)	HLtot	FT PROD. (GAS)	9.318	35.407	77.160	135.033	208.305
GG	PRESSURE @ TANK	(SEE NOTE f)	P1	PSFA	1974.55	1979.44	1987.26	1998.11	2011.84
HH	"	GG/144	"	PSIA	13.71	13.75	13.80	13.88	13.97
II	"	HH-14.7	"	PSIG	-0.99	-0.95	-0.90	-0.82	-0.73
JJ	(P1 - P2) / P1	(HH-K) / HH			0.1%	0.3%	0.7%	1.3%	1.9%
KK	(P1 - P2) / P1 < 10% ??				YES	YES	YES	YES	YES
PP	(P1 - P2)	(II-J)		PSI	0.0121	0.0461	0.1004	0.1758	0.2711

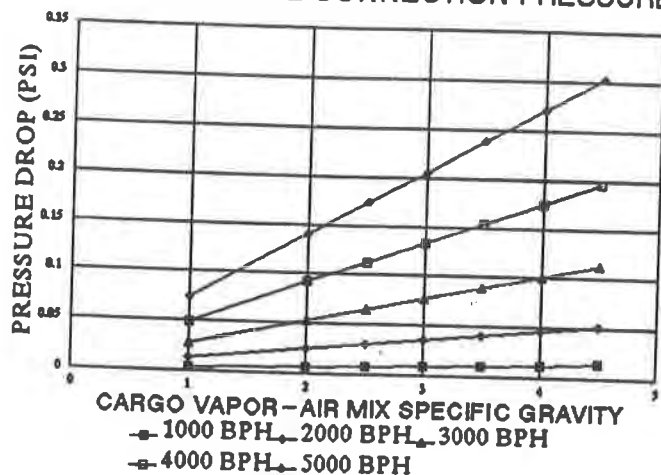
DATA FOR TRANSFER RATE VS PRESSURE DROP

NOTES:

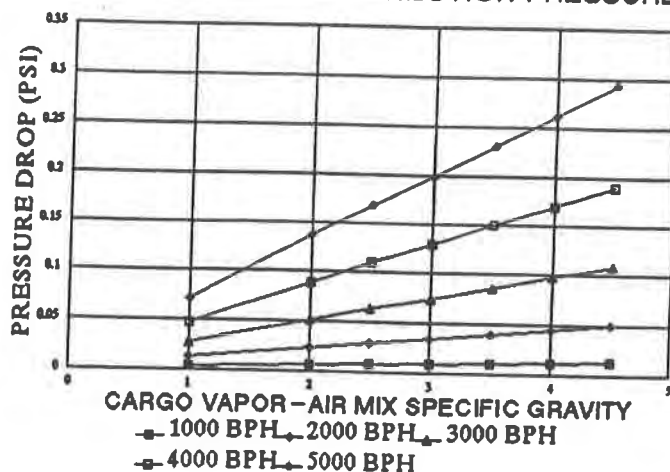
- 46 CFR 39.30.1 (b) REQUIRES THAT, FOR GASOLINE, CRUDE OIL, AND BENZENE, PRESSURE DROP THROUGH THE VAPOR COLLECTION SYSTEM FROM THE MOST REMOTE CARGO TANK TO THE VESSEL VAPOR CONNECTION MUST BE DETERMINED BASED ON A 50 PERCENT CARGO VAPOR AND AIR MIXTURE. PER DALTON'S LAW OF PARTIAL PRESSURES, AND ASSUMING THE MIXTURE IS 50/50 BY VOLUME, THE SPECIFIC GRAVITY OF THE MIXTURE CAN BE DETERMINED AS FOLLOWS:
- $$SG_{mix} = \{ (N/2) * MW_{air} \} + \{ (N/2) * MW_{cargo} \} / (N * MW_{air}) \quad \text{WHERE}$$
- N = TOTAL NO. MOLECULES PER UNIT VOLUME
 MW_{air} = MOLECULAR WEIGHT OF AIR
 MW_{cargo} = MOLECULAR WEIGHT OF CARGO VAPOR
- $$SG_{mix} = 0.5 * (MW_{air} + MW_{cargo}) / MW_{air}$$
- A CORRESPONDING RELATIONSHIP IN TERMS OF SPECIFIC GRAVITY IS:
- $$SG_{mix} = (SG_{air} + SG_{cargo}) / 2$$
- FOR PRODUCTS OTHER THAN THOSE CITED ABOVE, THE SPECIFIC GRAVITY OF THE MIX CAN BE DETERMINED AS:
- $$SG_{mix} = W_{v-a,115} / W_{a,115} \quad \text{WHERE}$$
- W_{v-a,115} = VAPOR-AIR MIX WEIGHT DENSITY, & W_{a,115} = AIR WEIGHT DENSITY, BOTH AT 115 DEG F.
- b. THE SPECIFIC WEIGHT OF THE VAPOR/AIR MIXTURE IS OBTAINED BY MULTIPLYING THE SPECIFIC GRAVITY OF THE VAPOR/AIR MIXTURE BY THE WEIGHT OF AIR AS OBTAINED FROM THE FORMULA IN CRANE T.P. 410 (PAGE A-10) [I.E.,
- $$W_s = (M * P) / (10.72 * T) \quad \text{WHERE M IS THE MOLECULAR WEIGHT OF AIR (28.97), P IS PRESSURE IN PSIA (SEE BELOW), AND T IS ABSOLUTE TEMPERATURE IN RANKINE (F + 460) WITH T = 115 DEGREES FAHRENHEIT PER USCG GUIDANCE.}$$
- IF (P₁ - P₂)/P₁ < 10% THE ASSUMPTION THAT W_s = W_{s1} = W_{s2} (WITH W_{s2} EVALUATED @ P₂) CAN BE CONSIDERED TO BE APPROPRIATE; OTHERWISE, A SECOND ITERATION SHOULD BE PERFORMED USING
- $$W_s = W_{sav} = (W_{s1} + W_{s2}) / 2 \quad \text{(WITH W}_{s1} \text{ EVALUATED @ P}_1 \text{ AND W}_{s2} \text{ @ P}_2 \text{).}$$
- c. THE PRECISE VISCOSITY OF THE CARGO VAPOR-AIR MIXTURE IS NOT KNOWN; HOWEVER, THE VISCOSITY OF AIR @ 100 DEGREES F IS 0.019 CENTIPOISE (SEE CRANE T.P. 410 (PAGE A-5)).
- FOR PURPOSES OF THESE CALCULATIONS, ASSUMPTION THAT THE VISCOSITY OF THE CARGO-AIR MIXTURE IS THAT OF AIR AT 100 DEGREES F IS CONSIDERED REASONABLE.
- FOR REFERENCE AND COMPARISON, REPRESENTATIVE VALUES OF ABSOLUTE (DYNAMIC) VISCOSITY OF VARIOUS HYDROCARBON VAPOR AND NATURAL GASES MAY BE FOUND IN CRANE T.P. 410 (PAGE A-5).
- "LENGTH" IS THE DISTANCE BETWEEN THE MOST REMOTE CARGO TANK VAPOR INLET AND THE VESSEL'S VAPOR CONNECTION, AND IS ESTIMATED CONSERVATIVELY HIGH.
- e. BEND HEAD LOSS ASSUMES
- | SECTION I: | QTY | LOSS COEFF. | QT | LOSS COEFF. |
|---------------------|-----|-------------|-----------------|-------------|
| TEE (THRU RUN) | 3 | 0.60 | 90 DEG EL L.R.1 | 0.75 |
| TEE (THRU BRANCH) | 3 | 1.80 | 90 DEG EL | 0 N/A |
| OTHER | 0 | 0.75 | 45 DEG EL L.R.2 | 0.40 |
| TOTAL QTY FITTINGS: | 9 | | AVERAGE COEFF.: | 0.972 |
| SECTION II: | | | | |
| TEE (THRU RUN) | 0 | 0.6 | 90 DEG EL L.R.0 | 0.75 |
| TEE (THRU BRANCH) | 0 | 1.8 | 90 DEG EL | 0 N/A |
| OTHER | 0 | 0.75 | 45 DEG EL L.R.0 | 0.40 |
| TOTAL QTY FITTINGS: | 0 | | AVERAGE COEFF.: | 0.000 |
- f. BASED ON FROM DARCY'S EQUATION:
- $$P_1 - P_2 = W_s * f * L_{eq} * [V^2 / (2 * G)] / D \quad \text{(ADJUSTED AS REQ'D FOR UNIT COMPATIBILITY)}$$

GRAPH(S) FOR VAPOR GROWTH RATE (VGR) OF 100%

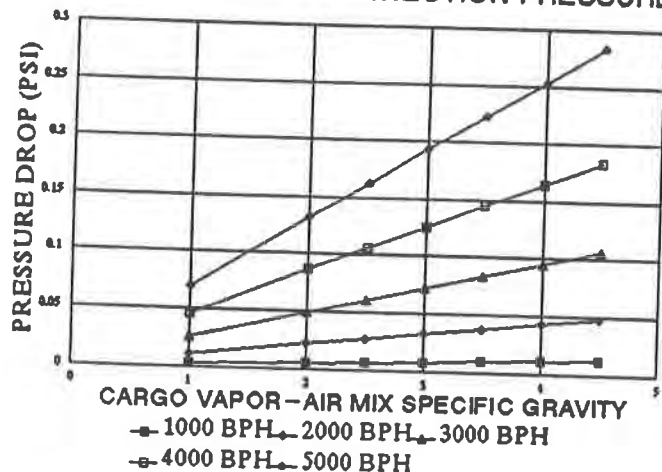
1.0 PSIG SHORE CONNECTION PRESSURE



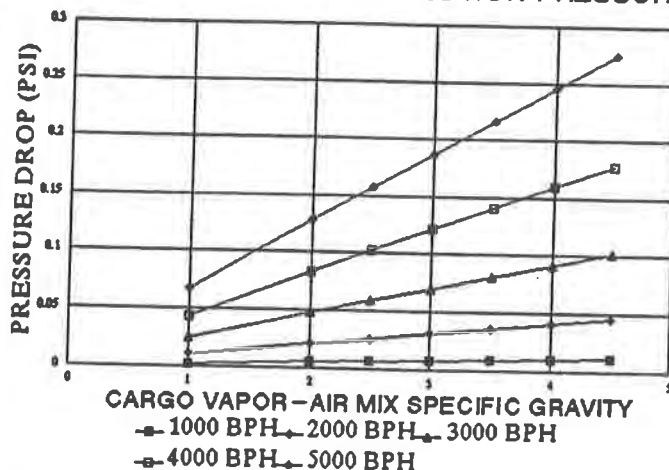
0.5 PSIG SHORE CONNECTION PRESSURE



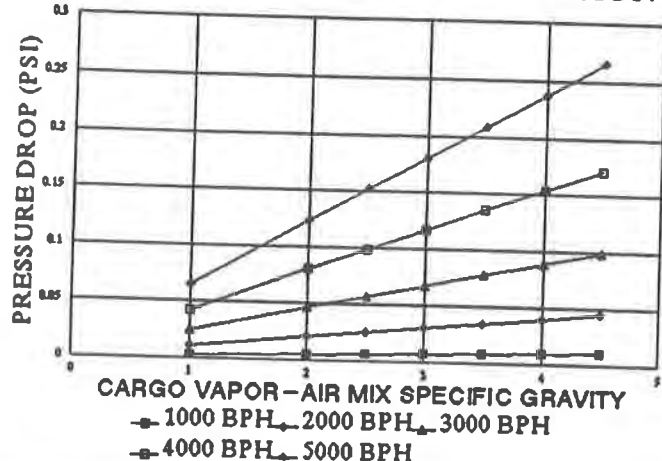
0.0 PSIG SHORE CONNECTION PRESSURE



-0.5 PSIG SHORE CONNECTION PRESSURE



-1.0 PSIG SHORE CONNECTION PRESSURE

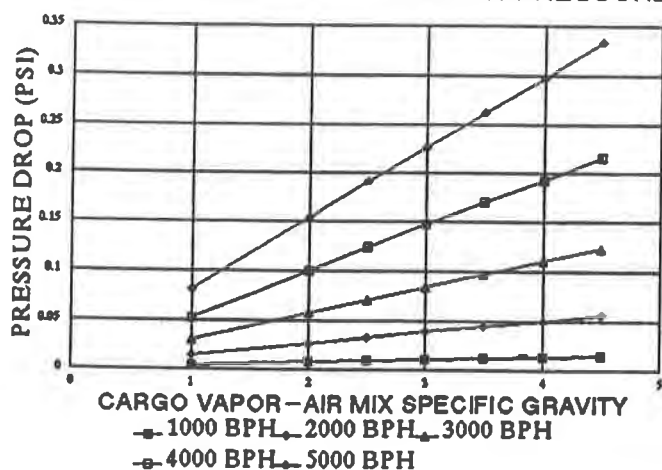
**DIRECTIONS: FOR THE CARGO TO BE TRANSFER'D:**

1. OBTAIN: (a) VAP.-AIR MIX GROWTH RATE (VGR), (b) VAP.-AIR MIX SPECIFIC GRAVITY, (c) MAX LIQUID TRANSFER RATE (MLTR), & (d) PRESSURE TO BE MAINTAINED @ THE SHORE CONNECTION.
2. SELECT THE GRAPH PAGE THAT APPLIES TO THE LESSER OF THE SAME OR NEXT HIGHER 'VGR'.
3. FROM THAT PAGE, SELECT THE GRAPH THAT APPLIES TO THE NEXT HIGHER 'SHORE CONNECTION PRESSURE'.
4. ENTER THAT GRAPH WITH 'SPECIFIC GRAVITY' & 'MAX LIQUID TRANSFER RATE' TO DETERMINE 'PRESSURE DROP' FROM THE MOST REMOTE CARGO TANK TO THE SHORE CONNEC'N.
5. IF THE SUM OF 'PRESS. DROP' + 'SHORE CONNEC'N PRESSURE' IS LESS THAN 80% OF THE P/V SETTING, THEN THE 'MLTR' IS OK.

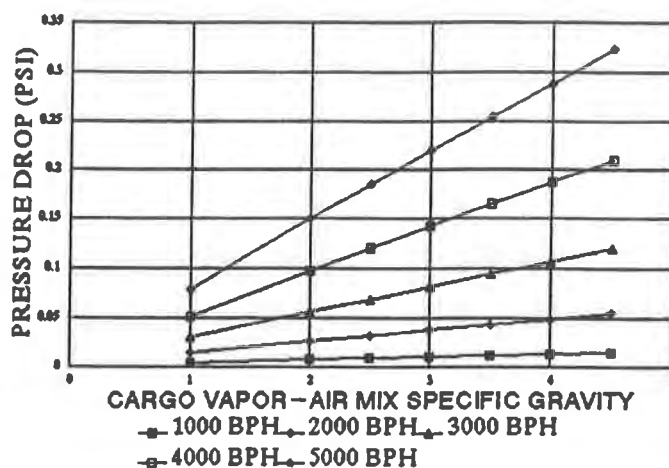
A. FLOW RATES SHOWN HEREON (I.E., 'BPH') ARE LIQUID TRANSFER RATES.
 B. PRESSURE DROP IS FOR CARGO VAPOR-AIR MIX FLOW RATE OF 'VGR' TIMES THE LIQUID TRANSFER RATE, AND IS FROM MOST REMOTE TANK TO SHORE CONNECTION.

GRAPH(S) FOR VAPOR GROWTH RATE (VGR) OF 105%

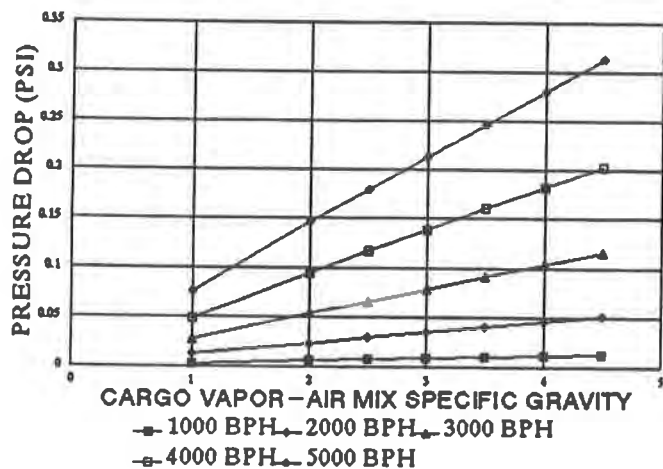
1.0 PSIG SHORE CONNECTION PRESSURE



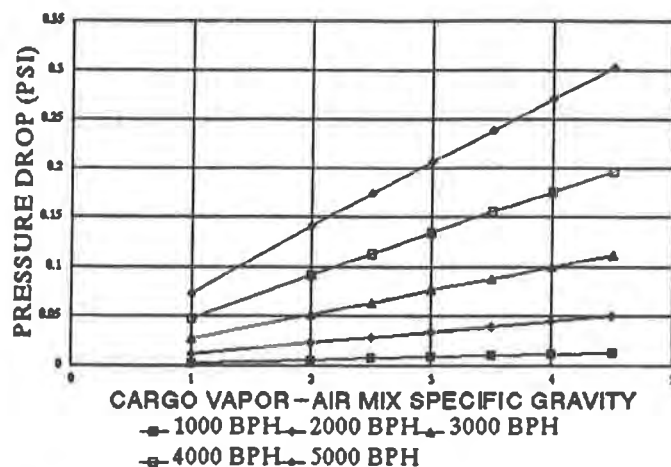
0.5 PSIG SHORE CONNECTION PRESSURE



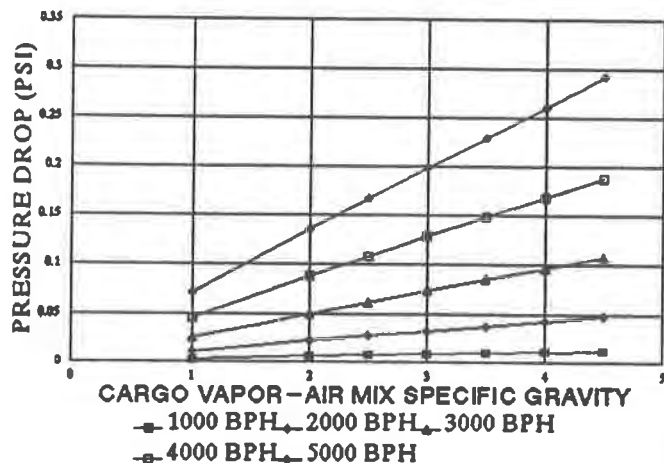
0.0 PSIG SHORE CONNECTION PRESSURE



-0.5 PSIG SHORE CONNECTION PRESSURE



-1.0 PSIG SHORE CONNECTION PRESSURE

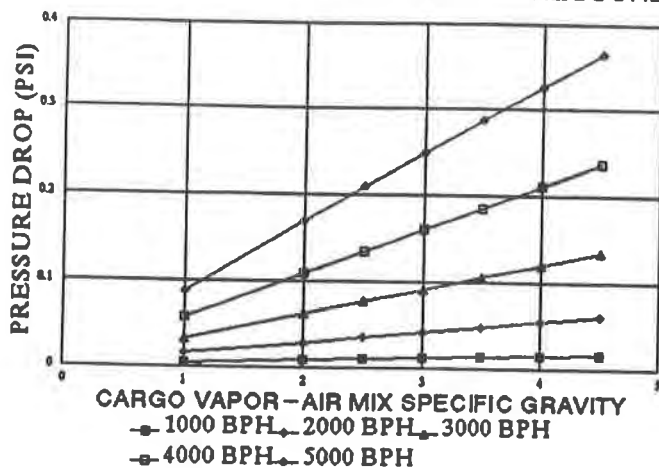
**DIRECTIONS: FOR THE CARGO TO BE TRANSFER'D:**

1. OBTAIN: (a) VAP.-AIR MIX GROWTH RATE (VGR), (b) VAP.-AIR MIX SPECIFIC GRAVITY, (c) MAX LIQUID TRANSFER RATE (MLTR), & (d) PRESSURE TO BE MAINTAINED @ THE SHORE CONNECTION.
2. SELECT THE GRAPH PAGE THAT APPLIES TO THE LESSER OF THE SAME OR NEXT HIGHER 'VGR'.
3. FROM THAT PAGE, SELECT THE GRAPH THAT APPLIES TO THE NEXT HIGHER 'SHORE CONNECTION PRESSURE'.
4. ENTER THAT GRAPH WITH 'SPECIFIC GRAVITY' & 'MAX LIQUID TRANSFER RATE' TO DETERMINE 'PRESSURE DROP' FROM THE MOST REMOTE CARGO TANK TO THE SHORE CONNEC'N.
5. IF THE SUM OF 'PRESS. DROP' + 'SHORE CONNEC'N PRESSURE' IS LESS THAN 80% OF THE P/V SETTING, THEN THE 'MLTR' IS OK.

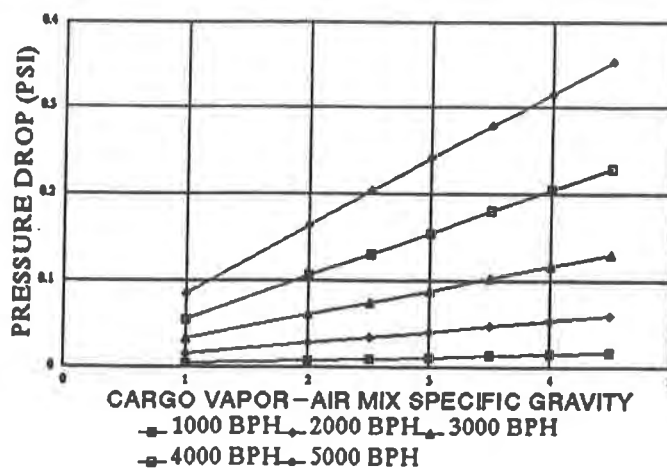
- A. FLOW RATES SHOWN HEREON (I.E., 'BPH') ARE LIQUID TRANSFER RATES.
 B. PRESSURE DROP IS FOR CARGO VAPOR-AIR MIX FLOW RATE OF 'VGR' TIMES THE LIQUID TRANSFER RATE, AND IS FROM MOST REMOTE TANK TO SHORE CONNECTION.

GRAPH(S) FOR VAPOR GROWTH RATE (VGR) OF 110%

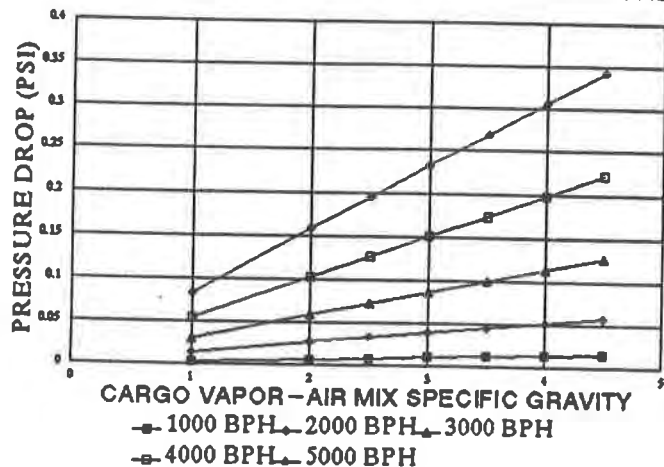
1.0 PSIG SHORE CONNECTION PRESSURE



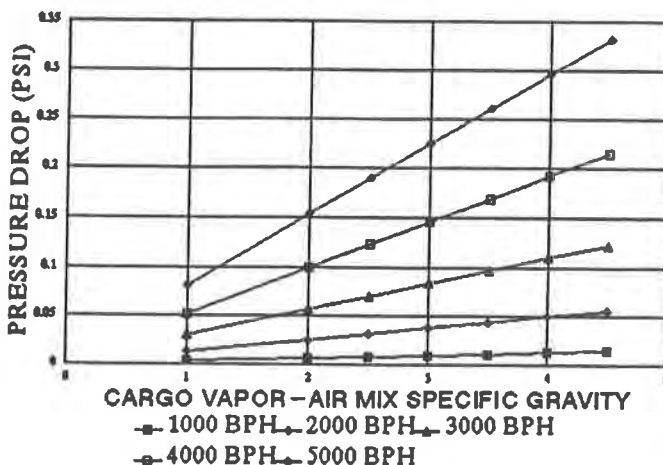
0.5 PSIG SHORE CONNECTION PRESSURE



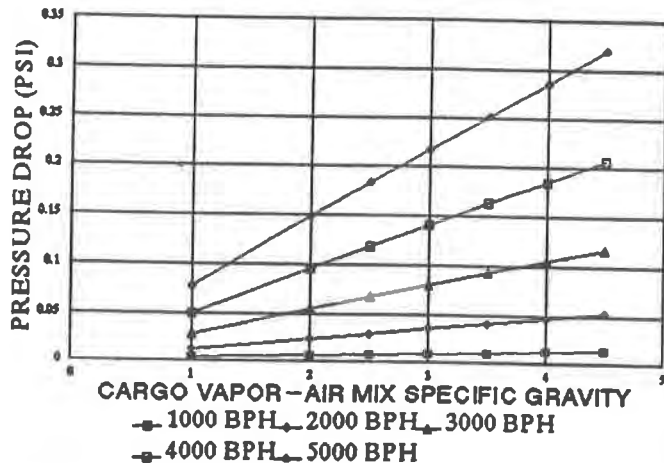
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-0.5 PSIG SHORE CONNECTION PRESSURE



-1.0 PSIG SHORE CONNECTION PRESSURE

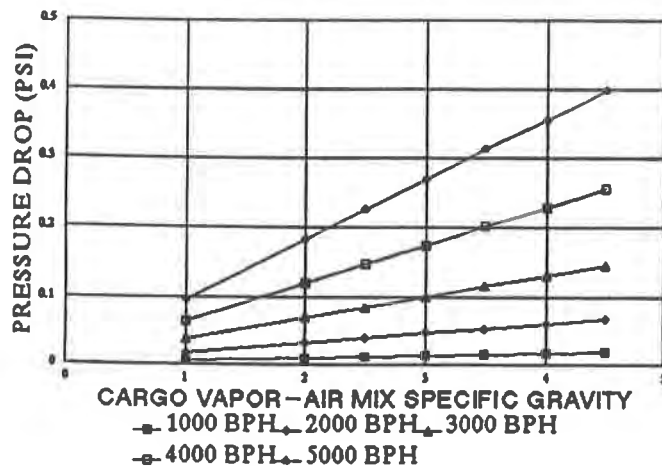
**DIRECTIONS: FOR THE CARGO TO BE TRANSFER'D:**

1. OBTAIN: (a) VAP.-AIR MIX GROWTH RATE (VGR), (b) VAP.-AIR MIX SPECIFIC GRAVITY, (c) MAX LIQUID TRANSFER RATE (MLTR), & (d) PRESSURE TO BE MAINTAINED @ THE SHORE CONNECTION.
2. SELECT THE GRAPH PAGE THAT APPLIES TO THE LESSER OF THE SAME OR NEXT HIGHER 'VGR'.
3. FROM THAT PAGE, SELECT THE GRAPH THAT APPLIES TO THE NEXT HIGHER 'SHORE CONNECTION PRESSURE'.
4. ENTER THAT GRAPH WITH 'SPECIFIC GRAVITY' & 'MAX LIQUID TRANSFER RATE' TO DETERMINE 'PRESSURE DROP' FROM THE MOST REMOTE CARGO TANK TO THE SHORE CONNEC'N.
5. IF THE SUM OF 'PRESS. DROP' + 'SHORE CONNEC'N PRESSURE' IS LESS THAN 80% OF THE P/V SETTING, THEN THE 'MLTR' IS OK.

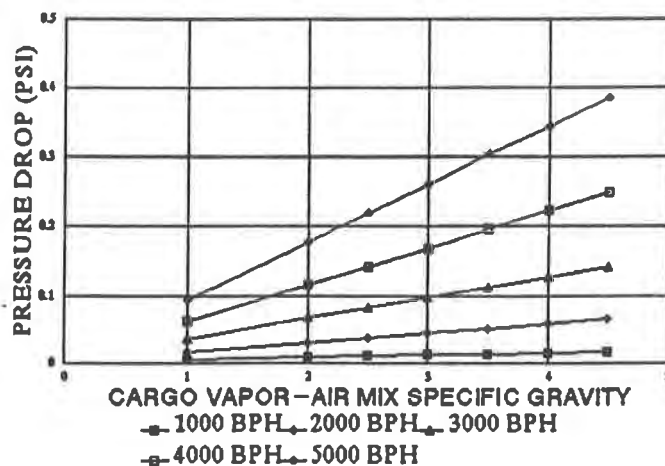
A. FLOW RATES SHOWN HEREON (I.E., 'BPH') ARE LIQUID TRANSFER RATES.
 B. PRESSURE DROP IS FOR CARGO VAPOR-AIR MIX FLOW RATE OF 'VGR' TIMES THE LIQUID TRANSFER RATE, AND IS FROM MOST REMOTE TANK TO SHORE CONNECTION.

GRAPH(S) FOR VAPOR GROWTH RATE (VGR) OF 115%

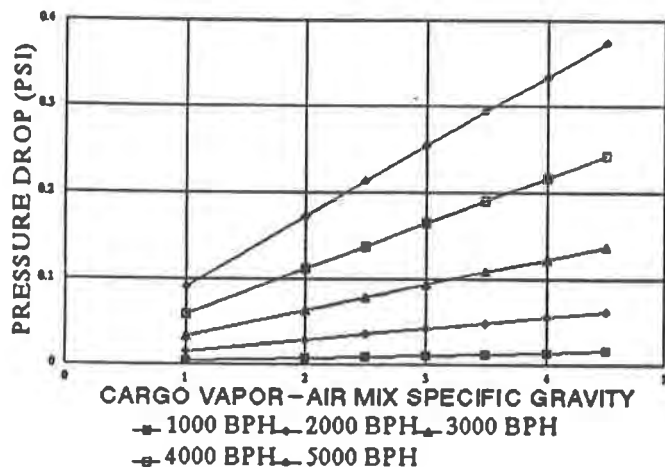
1.0 PSIG SHORE CONNECTION PRESSURE



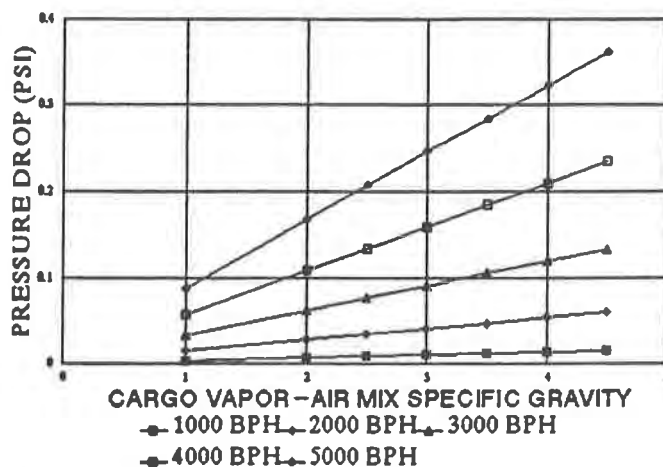
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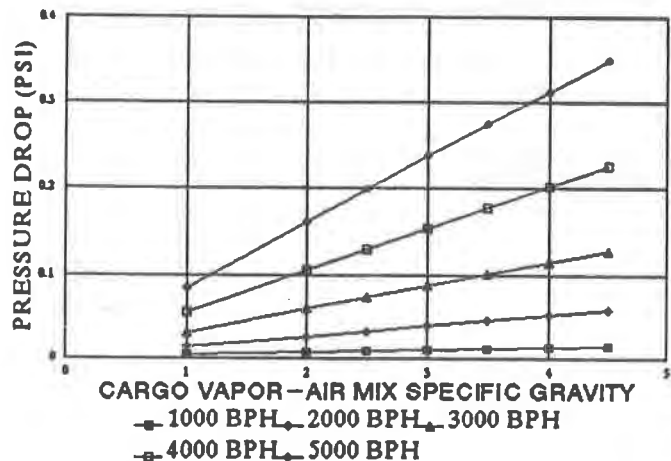
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-0.5 PSIG SHORE CONNECTION PRESSURE



-1.0 PSIG SHORE CONNECTION PRESSURE

**DIRECTIONS: FOR THE CARGO TO BE TRANSFER'D:**

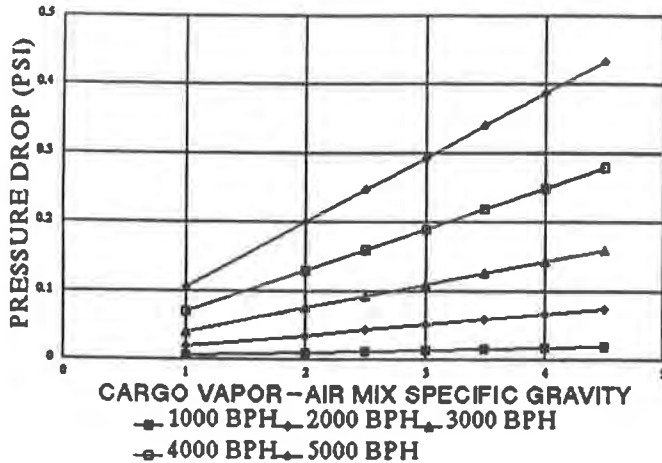
1. OBTAIN: (a) VAP.-AIR MIX GROWTH RATE (VGR), (b) VAP.-AIR MIX SPECIFIC GRAVITY, (c) MAX LIQUID TRANSFER RATE (MLTR), & (d) PRESSURE TO BE MAINTAINED @ THE SHORE CONNECTION.
2. SELECT THE GRAPH PAGE THAT APPLIES TO THE LESSER OF THE SAME OR NEXT HIGHER 'VGR'.
3. FROM THAT PAGE, SELECT THE GRAPH THAT APPLIES TO THE NEXT HIGHER 'SHORE CONNECTION PRESSURE'.
4. ENTER THAT GRAPH WITH 'SPECIFIC GRAVITY' & 'MAX LIQUID TRANSFER RATE' TO DETERMINE 'PRESSURE DROP' FROM THE MOST REMOTE CARGO TANK TO THE SHORE CONNEC'N.
5. IF THE SUM OF 'PRESS. DROP' + 'SHORE CONNEC'N PRESSURE' IS LESS THAN 80% OF THE P/V SETTING, THEN THE 'MLTR' IS OK.

A. FLOW RATES SHOWN HEREON (I.E., "BPH") ARE LIQUID TRANSFER RATES.

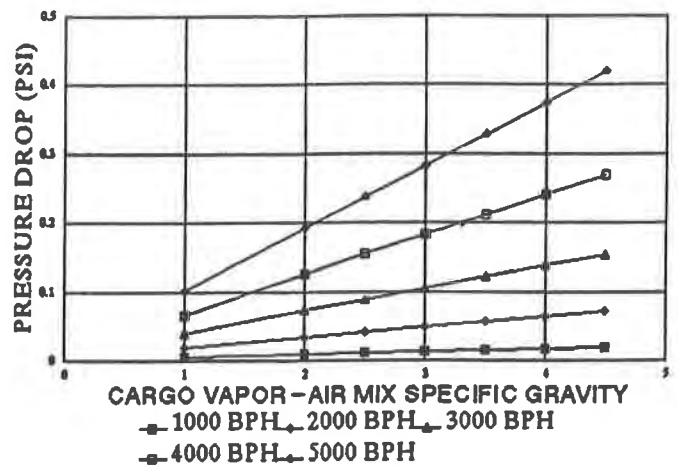
B. PRESSURE DROP IS FOR CARGO VAPOR-AIR MIX FLOW RATE OF 'VGR' TIMES THE LIQUID TRANSFER RATE, AND IS FROM MOST REMOTE TANK TO SHORE CONNECTION.

GRAPH(S) FOR VAPOR GROWTH RATE (VGR) OF 120%

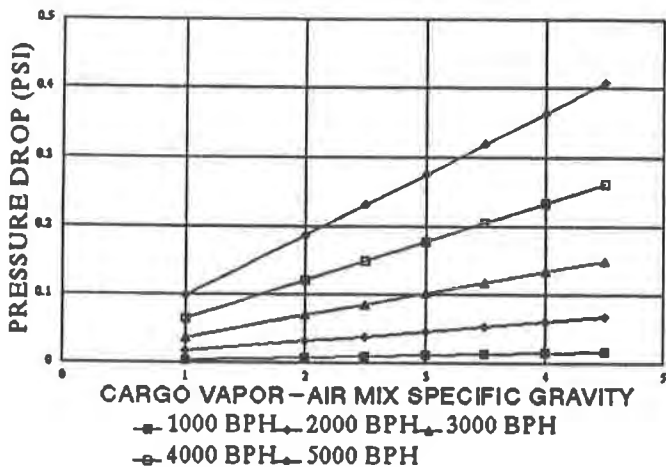
1.0 PSIG SHORE CONNECTION PRESSURE



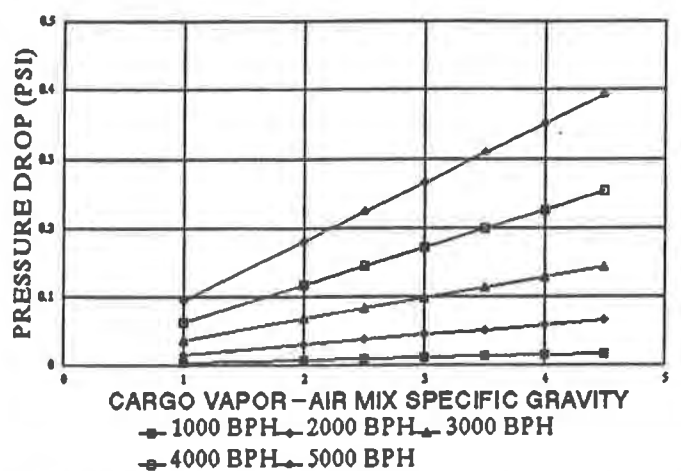
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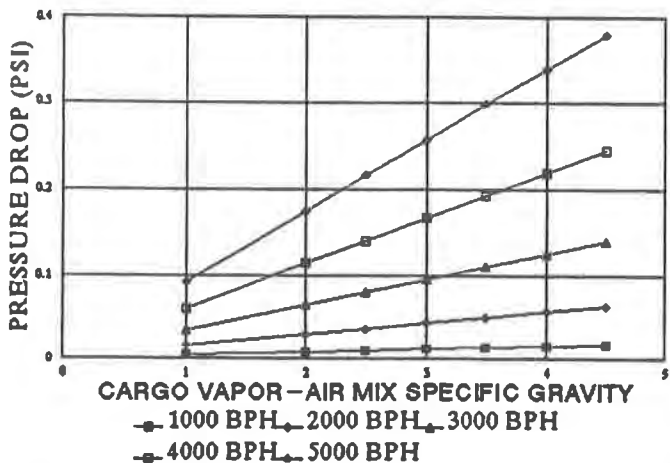
0.0 PSIG SHORE CONNECTION PRESSURE



-0.5 PSIG SHORE CONNECTION PRESSURE



-1.0 PSIG SHORE CONNECTION PRESSURE

**DIRECTIONS: FOR THE CARGO TO BE TRANSFER'D:**

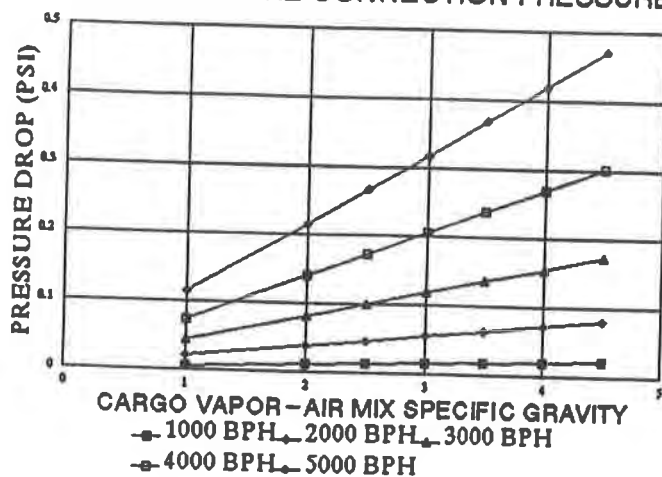
1. OBTAIN: (a) VAP.-AIR MIX GROWTH RATE (VGR), (b) VAP.-AIR MIX SPECIFIC GRAVITY, (c) MAX LIQUID TRANSFER RATE (MLTR), & (d) PRESSURE TO BE MAINTAINED @ THE SHORE CONNECTION.
2. SELECT THE GRAPH PAGE THAT APPLIES TO THE LESSER OF THE SAME OR NEXT HIGHER 'VGR'.
3. FROM THAT PAGE, SELECT THE GRAPH THAT APPLIES TO THE NEXT HIGHER 'SHORE CONNECTION PRESSURE'.
4. ENTER THAT GRAPH WITH 'SPECIFIC GRAVITY' & 'MAX LIQUID TRANSFER RATE' TO DETERMINE 'PRESSURE DROP' FROM THE MOST REMOTE CARGO TANK TO THE SHORE CONNEC'N.
5. IF THE SUM OF 'PRESS. DROP' + 'SHORE CONNEC'N PRESSURE' IS LESS THAN 80% OF THE P/V SETTING, THEN THE 'MLTR' IS OK.

A. FLOW RATES SHOWN HEREON (I.E., 'BPH') ARE LIQUID TRANSFER RATES.

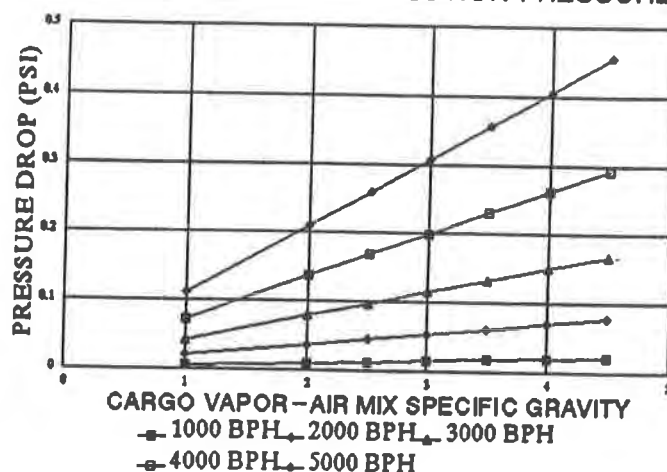
B. PRESSURE DROP IS FOR CARGO VAPOR-AIR MIX FLOW RATE OF 'VGR' TIMES THE LIQUID TRANSFER RATE, AND IS FROM MOST REMOTE TANK TO SHORE CONNECTION.

GRAPH(S) FOR VAPOR GROWTH RATE (VGR) OF 125%

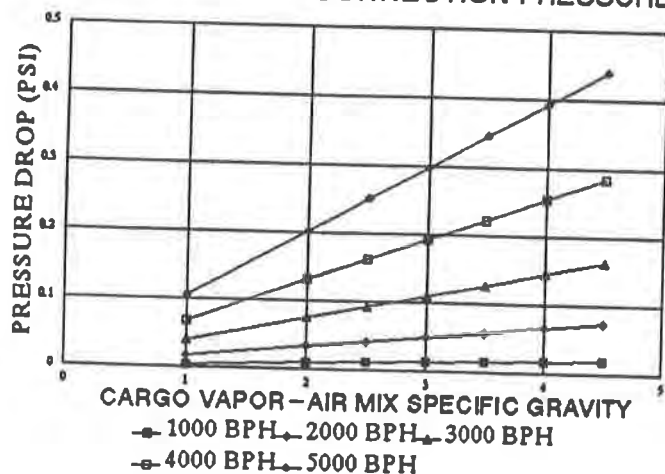
1.0 PSIG SHORE CONNECTION PRESSURE



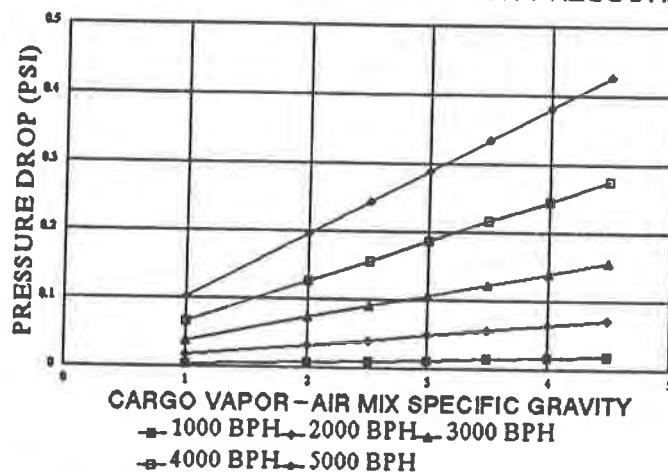
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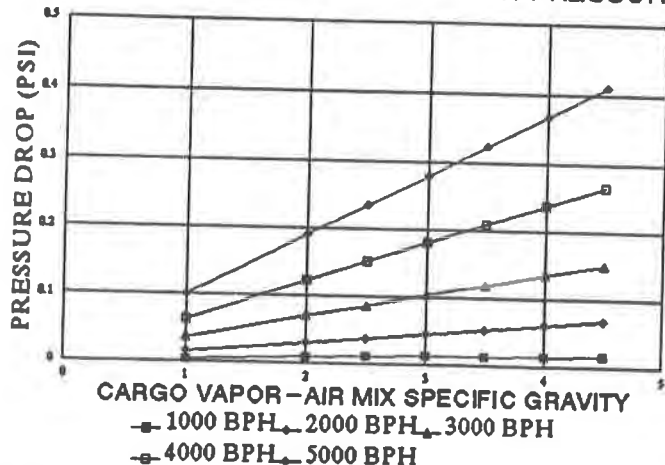
0.0 PSIG SHORE CONNECTION PRESSURE



-0.5 PSIG SHORE CONNECTION PRESSURE



-1.0 PSIG SHORE CONNECTION PRESSURE

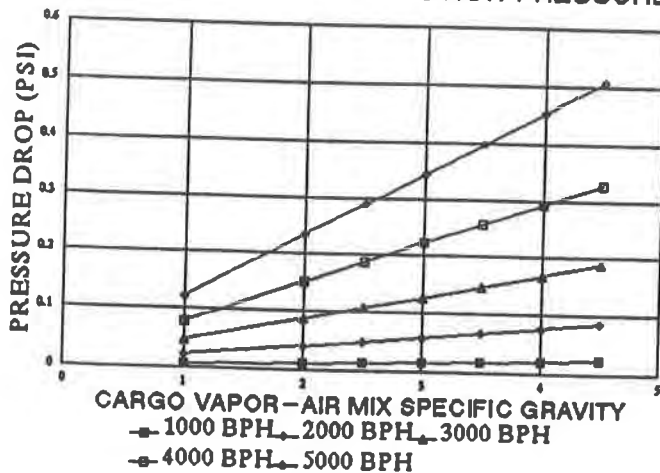
**DIRECTIONS: FOR THE CARGO TO BE TRANSFER'D:**

1. OBTAIN: (a) VAP. - AIR MIX GROWTH RATE (VGR), (b) VAP. - AIR MIX SPECIFIC GRAVITY, (c) MAX LIQUID TRANSFER RATE (MLTR), & (d) PRESSURE TO BE MAINTAINED @ THE SHORE CONNECTION.
2. SELECT THE GRAPH PAGE THAT APPLIES TO THE LESSER OF THE SAME OR NEXT HIGHER 'VGR'.
3. FROM THAT PAGE, SELECT THE GRAPH THAT APPLIES TO THE NEXT HIGHER 'SHORE CONNECTION PRESSURE'.
4. ENTER THAT GRAPH WITH 'SPECIFIC GRAVITY' & 'MAX LIQUID TRANSFER RATE' TO DETERMINE 'PRESSURE DROP' FROM THE MOST REMOTE CARGO TANK TO THE SHORE CONNEC'N.
5. IF THE SUM OF 'PRESS. DROP' + 'SHORE CONNEC'N PRESSURE' IS LESS THAN 80% OF THE P/V SETTING, THEN THE 'MLTR' IS OK.

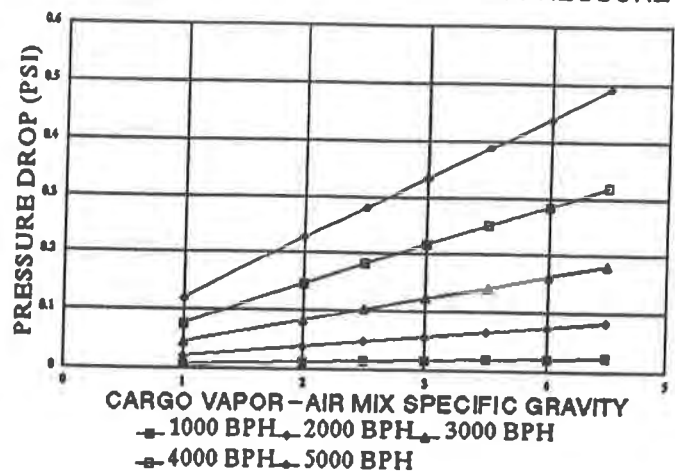
- A. FLOW RATES SHOWN HEREON (I.E., 'BPH') ARE LIQUID TRANSFER RATES.
 B. PRESSURE DROP IS FOR CARGO VAPOR-AIR MIX FLOW RATE OF 'VGR' TIMES THE LIQUID TRANSFER RATE, AND IS FROM MOST REMOTE TANK TO SHORE CONNECTION.

GRAPH(S) FOR VAPOR GROWTH RATE (VGR) OF 130%

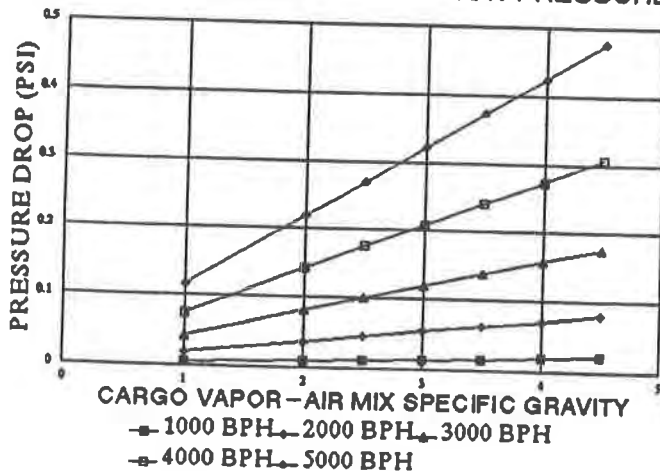
1.0 PSIG SHORE CONNECTION PRESSURE



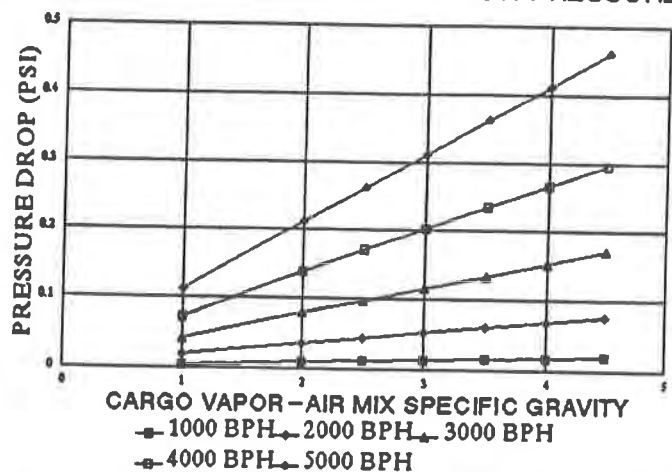
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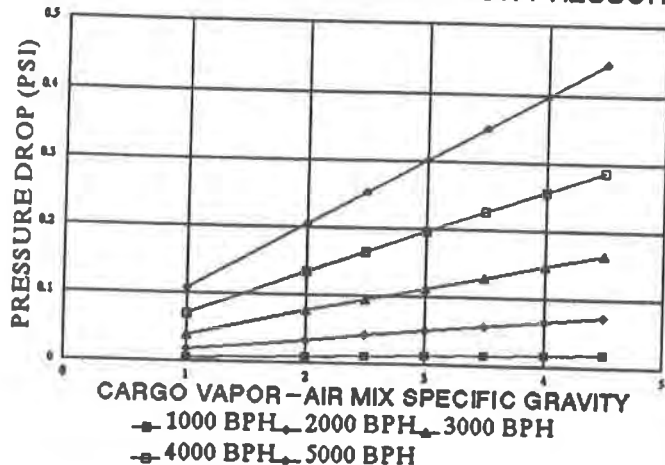
0.0 PSIG SHORE CONNECTION PRESSURE



-0.5 PSIG SHORE CONNECTION PRESSURE



-1.0 PSIG SHORE CONNECTION PRESSURE

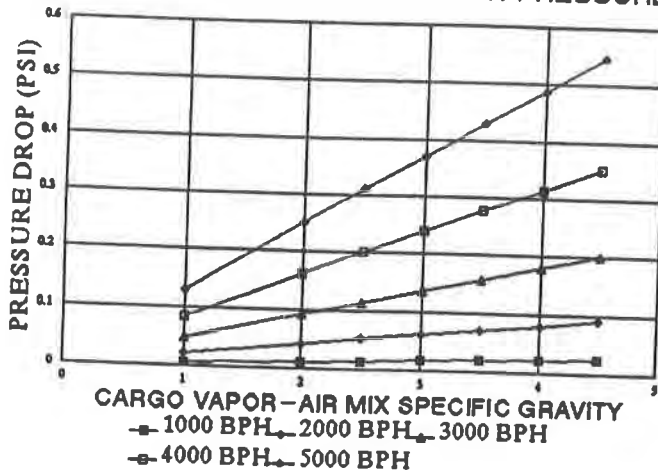
**DIRECTIONS: FOR THE CARGO TO BE TRANSFER'D:**

1. OBTAIN: (a) VAP.-AIR MIX GROWTH RATE (VGR), (b) VAP.-AIR MIX SPECIFIC GRAVITY, (c) MAX LIQUID TRANSFER RATE (MLTR), & (d) PRESSURE TO BE MAINTAINED @ THE SHORE CONNECTION.
2. SELECT THE GRAPH PAGE THAT APPLIES TO THE LESSER OF THE SAME OR NEXT HIGHER 'VGR'.
3. FROM THAT PAGE, SELECT THE GRAPH THAT APPLIES TO THE NEXT HIGHER 'SHORE CONNECTION PRESSURE'.
4. ENTER THAT GRAPH WITH 'SPECIFIC GRAVITY' & 'MAX LIQUID TRANSFER RATE' TO DETERMINE 'PRESSURE DROP' FROM THE MOST REMOTE CARGO TANK TO THE SHORE CONNEC'N.
5. IF THE SUM OF 'PRESS. DROP' + 'SHORE CONNEC'N PRESSURE' IS LESS THAN 80% OF THE P/V SETTING, THEN THE 'MLTR' IS OK.

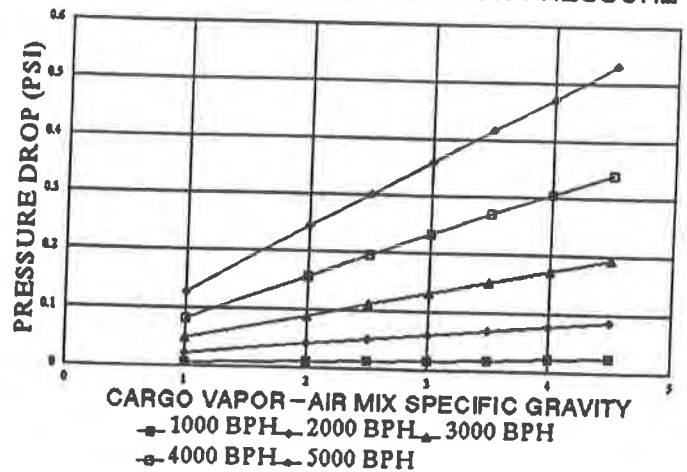
- A. FLOW RATES SHOWN HEREON (I.E., 'BPH') ARE LIQUID TRANSFER RATES.
 B. PRESSURE DROP IS FOR CARGO VAPOR-AIR MIX FLOW RATE OF 'VGR' TIMES THE LIQUID TRANSFER RATE, AND IS FROM MOST REMOTE TANK TO SHORE CONNECTION.

GRAPH(S) FOR VAPOR GROWTH RATE (VGR) OF 135%

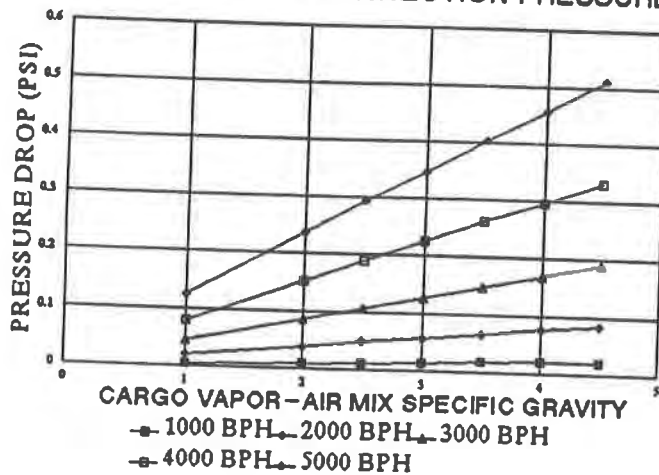
1.0 PSIG SHORE CONNECTION PRESSURE



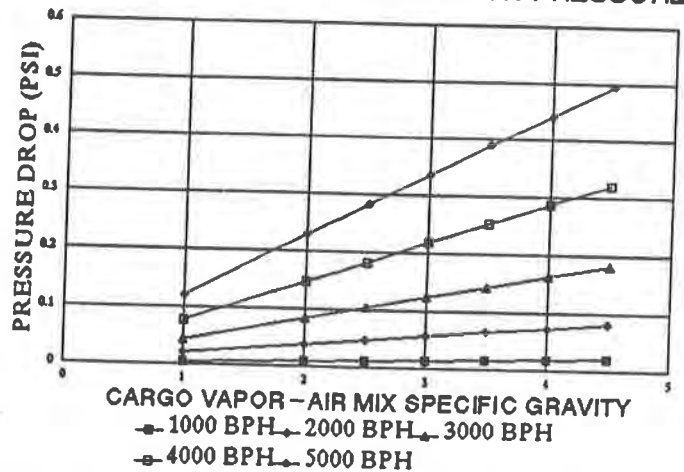
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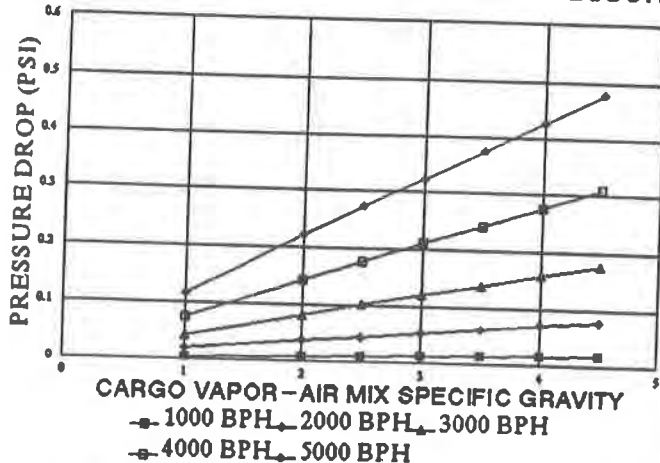
0.0 PSIG SHORE CONNECTION PRESSURE



-0.5 PSIG SHORE CONNECTION PRESSURE



-1.0 PSIG SHORE CONNECTION PRESSURE

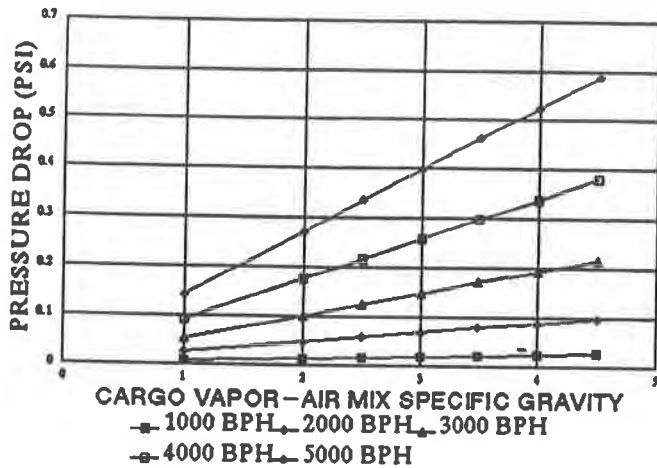


- DIRECTIONS: FOR THE CARGO TO BE TRANSFER'D:**
1. OBTAIN: (a) VAP.-AIR MIX GROWTH RATE (VGR), (b) VAP.-AIR MIX SPECIFIC GRAVITY, (c) MAX LIQUID TRANSFER RATE (MLTR), & (d) PRESSURE TO BE MAINTAINED @ THE SHORE CONNECTION.
 2. SELECT THE GRAPH PAGE THAT APPLIES TO THE LESSER OF THE SAME OR NEXT HIGHER 'VGR'.
 3. FROM THAT PAGE, SELECT THE GRAPH THAT APPLIES TO THE NEXT HIGHER 'SHORE CONNECTION PRESSURE'.
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 5. IF THE SUM OF 'PRESS. DROP' + 'SHORE CONNEC'N PRESSURE' IS LESS THAN 80% OF THE P/V SETTING, THEN THE 'MLTR' IS OK.

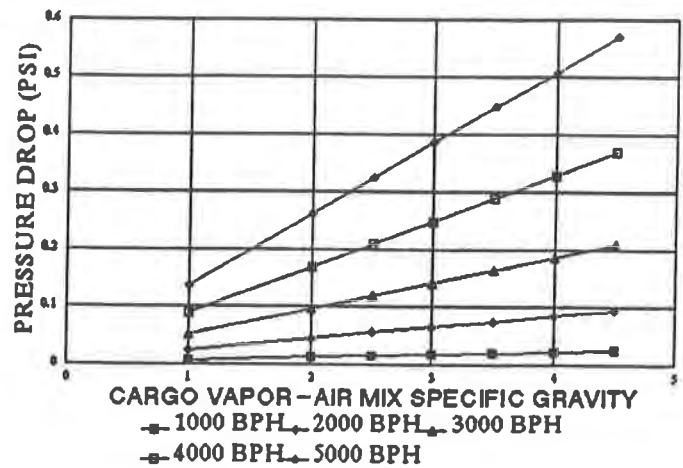
- A. FLOW RATES SHOWN HEREON (I.E., 'BPH') ARE LIQUID TRANSFER RATES.
B. PRESSURE DROP IS FOR CARGO VAPOR-AIR MIX FLOW RATE OF 'VGR' TIMES THE LIQUID TRANSFER RATE, AND IS FROM MOST REMOTE TANK TO SHORE CONNECTION.

GRAPH(S) FOR VAPOR GROWTH RATE (VGR) OF 140%

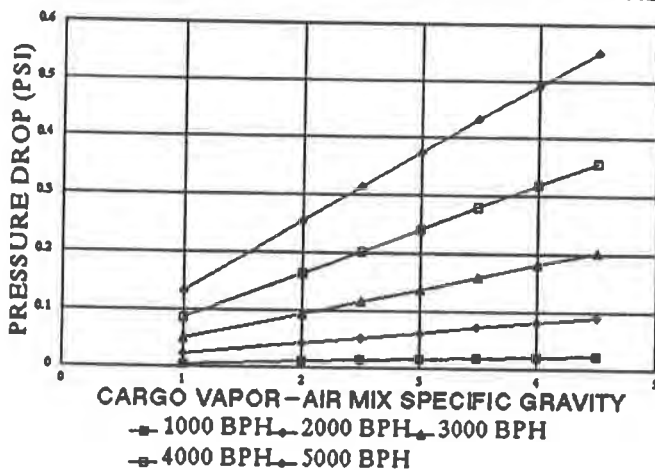
1.0 PSIG SHORE CONNECTION PRESSURE



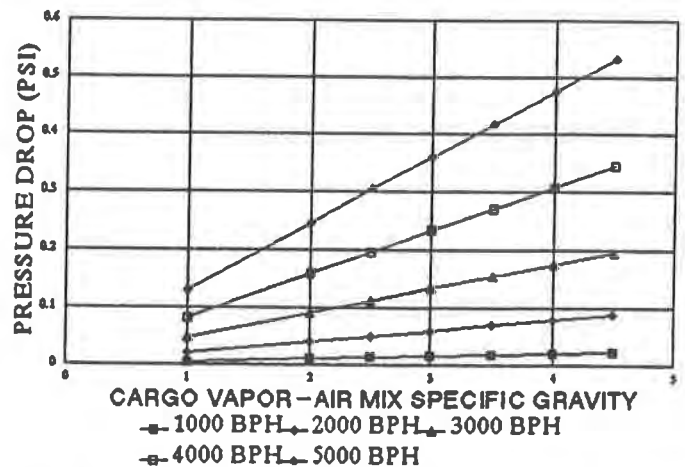
0.5 PSIG SHORE CONNECTION PRESSURE



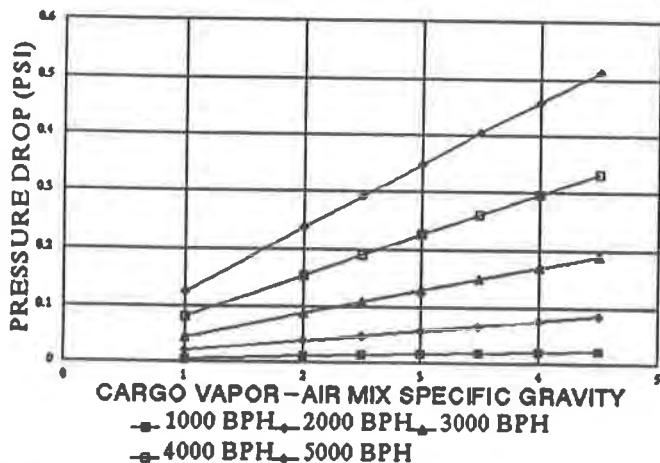
0.0 PSIG SHORE CONNECTION PRESSURE



-0.5 PSIG SHORE CONNECTION PRESSURE



-1.0 PSIG SHORE CONNECTION PRESSURE

**DIRECTIONS: FOR THE CARGO TO BE TRANSFER'D:**

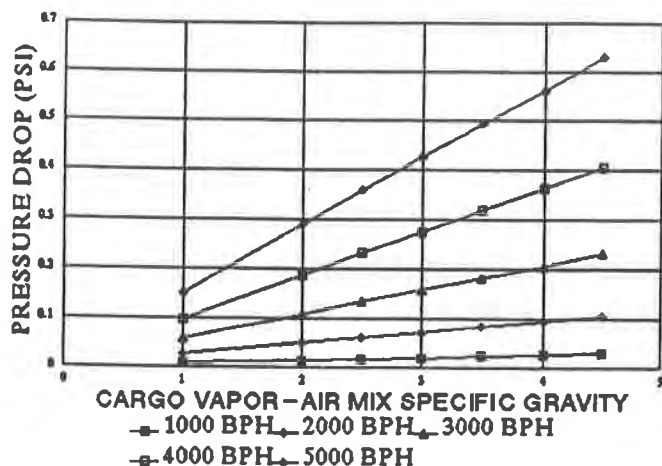
1. OBTAIN: (a) VAP.-AIR MIX GROWTH RATE (VGR), (b) VAP.-AIR MIX SPECIFIC GRAVITY, (c) MAX LIQUID TRANSFER RATE (MLTR), & (d) PRESSURE TO BE MAINTAINED @ THE SHORE CONNECTION.
2. SELECT THE GRAPH PAGE THAT APPLIES TO THE LESSER OF THE SAME OR NEXT HIGHER 'VGR'.
3. FROM THAT PAGE, SELECT THE GRAPH THAT APPLIES TO THE NEXT HIGHER 'SHORE CONNECTION PRESSURE'.
4. ENTER THAT GRAPH WITH 'SPECIFIC GRAVITY' & 'MAX LIQUID TRANSFER RATE' TO DETERMINE 'PRESSURE DROP' FROM THE MOST REMOTE CARGO TANK TO THE SHORE CONNEC'N.
5. IF THE SUM OF 'PRESS. DROP' + 'SHORE CONNEC'N PRESSURE' IS LESS THAN 80% OF THE P/V SETTING, THEN THE 'MLTR' IS OK.

A. FLOW RATES SHOWN HEREON (I.E., 'BPH') ARE LIQUID TRANSFER RATES.

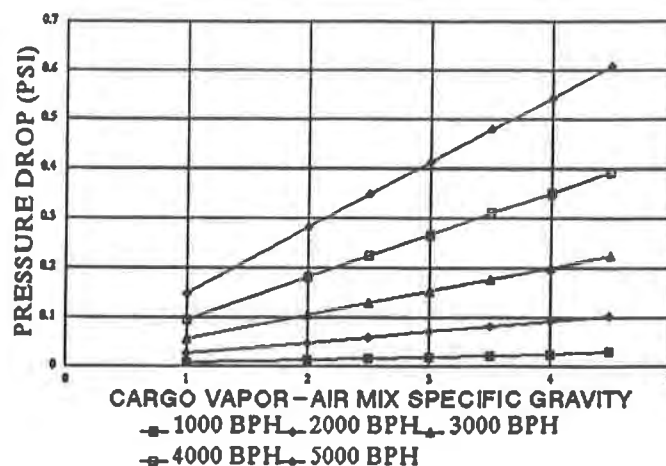
B. PRESSURE DROP IS FOR CARGO VAPOR-AIR MIX FLOW RATE OF 'VGR' TIMES THE LIQUID TRANSFER RATE, AND IS FROM MOST REMOTE TANK TO SHORE CONNECTION.

GRAPH(S) FOR VAPOR GROWTH RATE (VGR) OF 145%

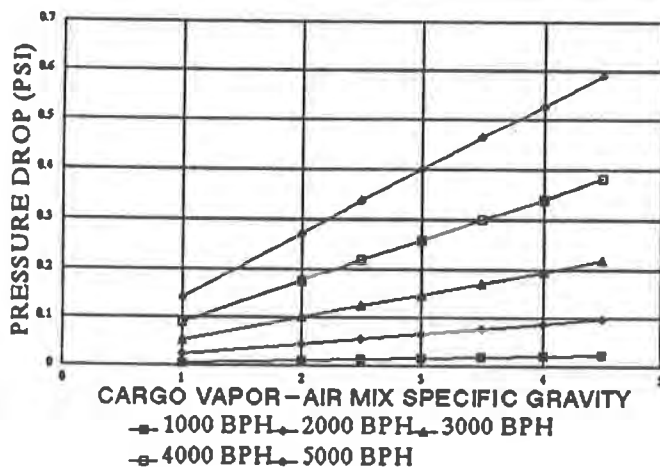
1.0 PSIG SHORE CONNECTION PRESSURE



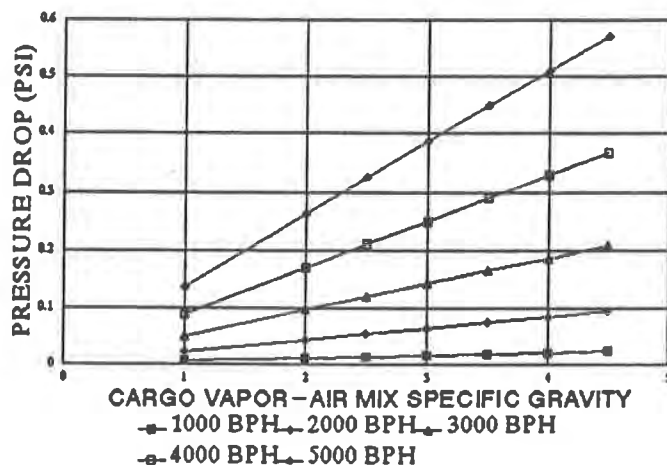
0.5 PSIG SHORE CONNECTION PRESSURE



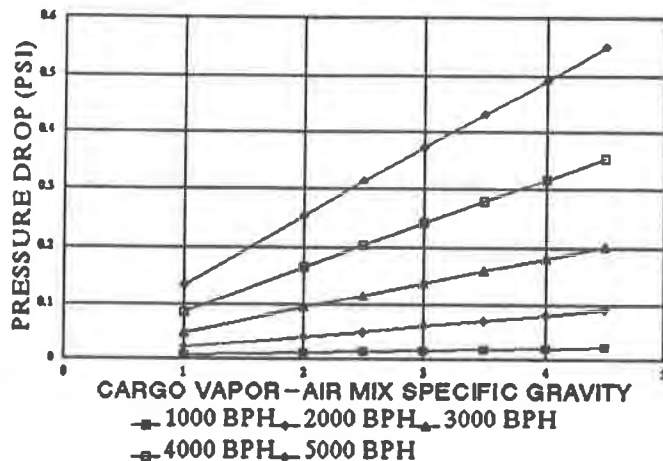
0.0 PSIG SHORE CONNECTION PRESSURE



-0.5 PSIG SHORE CONNECTION PRESSURE



-1.0 PSIG SHORE CONNECTION PRESSURE

**DIRECTIONS: FOR THE CARGO TO BE TRANSFER'D:**

1. OBTAIN: (a) VAP.-AIR MIX GROWTH RATE (VGR), (b) VAP.-AIR MIX SPECIFIC GRAVITY, (c) MAX LIQUID TRANSFER RATE (MLTR), & (d) PRESSURE TO BE MAINTAINED @ THE SHORE CONNECTION.
2. SELECT THE GRAPH PAGE THAT APPLIES TO THE LESSER OF THE SAME OR NEXT HIGHER 'VGR'.
3. FROM THAT PAGE, SELECT THE GRAPH THAT APPLIES TO THE NEXT HIGHER 'SHORE CONNECTION PRESSURE'.
4. ENTER THAT GRAPH WITH 'SPECIFIC GRAVITY' & 'MAX LIQUID TRANSFER RATE' TO DETERMINE 'PRESSURE DROP' FROM THE MOST REMOTE CARGO TANK TO THE SHORE CONNEC'N.
5. IF THE SUM OF 'PRESS. DROP' + 'SHORE CONNEC'N PRESSURE' IS LESS THAN 80% OF THE P/V SETTING, THEN THE 'MLTR' IS OK.

A. FLOW RATES SHOWN HEREON (I.E., 'BPH') ARE LIQUID TRANSFER RATES.

B. PRESSURE DROP IS FOR CARGO VAPOR-AIR MIX FLOW RATE OF 'VGR' TIMES THE LIQUID TRANSFER RATE, AND IS FROM MOST REMOTE TANK TO SHORE CONNECTION.

CALCULATIONS FOR PRESSURE DROP FROM MOST REMOTE CARGO TANK TO VESSEL VAPOR SHORE CONNECTION
 BARGE: C9706: CONOCO, INC.; E344

MAX DESIGN WORKING PRESS
DESIGN TEMPERATURE
"TARGET" MAX LIQUID TRANSFER RATE
PRESSURE AT VESSEL VAPOR SHORE CONNECTION
PIPING SECTION 1:

MOST REMOTE CARGO TANK OUTLET TO SHORE CONN
DISTANCE ENROUTE TO PV
ENTRANCE LOSS (K_e)
BEND LOSS (K_b)

VALVE LOSS (Kv)

EXIT LOSS (Kex)
PIPING SECTION II:

MOST REMOTE CARGO TANK OUTLET TO SHORE CONN
DISTANCE ENROUTE TO PV
ENTRANCE LOSS (K_e)
BEND LOSS (K_b)

VALVE LOSS (Kv)

EXIT LOSS (Kex)

CARGO VISCOSITY

NOTES: 1. LIQUID SPECIFIC GRAVITY; MOLECULAR WEIGHT OF CARGO
2. SPECIFIC GRAVITY OF CARGO VAPOR
3. SATURATED VAPOR PRESSURE @ 115 F
4. TOTAL VAPOR-AIR PRESSURE @ 115 F
5. PARTIAL VOLUME OF VAPOR @ 115 F
6. PARTIAL VOLUME OF AIR @ 115 F
7. AIR WEIGHT DENSITY @ 115 F & SHORE CONN. PRESS.

8. VAPOR-AIR WEIGHT DENSITY @ 115 F & SHORE CONN. PRESS.
9. VAPOR GROWTH RATE (SEE ALSO NOTE NO. 14)
10. LIQUID TRANSFER RATE
11. VAPOR-AIR MIXTURE FLOW RATE
12. REQUIRED AIR EQUIVALENT FLOW RATE

TABLE IV: INPUT DATA & NOTES

N/A PSIG				INCREMENTS FOR PERCENT OF MLTR:			
(MDWP)	> =	N/A	PSIG				
(T)		115	F				
(TMLTR)		5000	BPH				
(Pb/c)		1.00	PSIG --->	15.7	PSIA		
NOM I.D.		8	IN ----->	I.D.	7.981	IN	
ROUGHNESS		0.00015	AREA		0.347	FT^2	
		280	FT				
		0.5					
		QTY	LOSS COEF	TOTAL			
TEE (THRU RUN)		3	0.60	1.800	90 DEG EL L.R.		
TEE (THRU BRANCH)		3	1.80	5.400	90 DEG EL		
OTHER		0	0.75	0.000	45 DEG EL L.R.		
TOTAL:		9	AVG:	0.972			
		QTY	LOSS COEF	TOTAL			
GATE	*	0	0.19	0.000			
BUTTERFLY	*	1	0.65	0.650			
OTHER	*	0	N/A	0.000			
		1	AVG:	0.650			
		0					
NOM I.D.		N/A	IN ----->	I.D.	0.000	IN	
ROUGHNESS		0.00015	AREA		0.000	FT^2	
		0	FT				
		0					
		QTY	LOSS COEF	TOTAL			
TEE (THRU RUN)		0	0.60	0.000	90 DEG EL L.R.		
TEE (THRU BRANCH)		0	1.80	0.000	90 DEG EL		
OTHER		0	0.75	0.000	45 DEG EL L.R.		
TOTAL:		0	AVG:	0.000			
		QTY	LOSS COEF	TOTAL			
GATE	*	0	0.19	0.000			
BUTTERFLY	*	0	0.65	0.000			
OTHER	*	0	N/A	0.000			
		0	AVG:	0.000			
		0					
		0.019	CP ----->	3.97E-07	LB SEC/FT^2		

```

      SGV      OBTAIN FROM REFERENCE SOURCE
      Pv,115   (CARGO MW / AIR MW), OR FM REF. SOURCE
      Pt,115   OBTAIN FROM REFERENCE SOURCE
      Vv,115   EST'D TO BE SAME SHORE PRESS (Ps/c)
      Va,115   Pv,115 / Pt,115
      Wa,115   (Pt,115 - Pv,115) / Pt,115
      Mwa * Ps/c      Mwa = MOLEC. WT. OF AIR
      -----      =      28.97
      10.72*(460+T)
Wv-a,115 [(SGV*Vv,115)+Va,115]*(0.0047*Ps/c)
VGR      ESTIMATED TO BE 1 + (0.25*Pv,115/12.5)
Q1
Qv-a     Q1 * VGR
Qa       Qv-a*(Wv-a,115/Wa,115)^.5

```

13. USCG VAP COLLECT'N SYS. CARGO CATEGORIES
 1. NO ADD'L VCS REQMTS ABOVE THOSE FOR BENZENE, GASOLINE & CRUDE OIL
 2. POLYMERIZES
 3. HGHLY TOXIC
 4. POLYMERIZES & HIGHLY TOXIC
 5. HIGH VAPOR GROWTH RATE
 6. HIGH VAP GROWTH RATE & HIGHLY TOXIC
 7. HIGH VAP GROWTH RATE & POLYMERIZES
 8. MORE INFO NEEDED BEFORE REQMTS CAN BE DETERMINED
14. VGR = 1.25 FOR GASOLINE, CRUDE OIL, AND BENZENE.
15. NF/NC = NON-FLAMMABLE/NON-COMBUSTIBLE

BARGE: C9706: CONOCO, INC.; E344

(SEE "TABLE IV" FOR APPLICABLE CONDITIONS)

CARGO

TABLE V: SUMMARY OF PRESSURE DROP FROM MOST REMOTE CARGO TANK TO VAPOR SHORE CONNECTION

	20.0%	40.0%	60.0%	80.0%	100.0%
	MAX	MAX	MAX	MAX	MAX
C	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
H	TRANSF	TRANSF	TRANSF	TRANSF	TRANSF
R	RATE	RATE	RATE	RATE	RATE
I	(MLTR)	(MLTR)	(MLTR)	(MLTR)	(MLTR)
S					
	1,000	2,000	3,000	4,000	5,000
	(BBL/	(BBL/	(BBL/	(BBL/	(BBL/
	HR)	HR)	HR)	HR)	HR)

AAC	0.004	0.014	0.030	0.052	0.080
ACA	0.004	0.014	0.030	0.051	0.079
ATN	0.003	0.013	0.028	0.048	0.074
ACR	0.004	0.013	0.029	0.050	0.077
ACN	0.005	0.019	0.041	0.071	0.109
ADN	0.003	0.013	0.028	0.048	0.074
ASX					
AEE	0.003	0.013	0.028	0.048	0.074
ABX					
AMH					
AHO					
BNZ	0.006	0.022	0.048	0.083	0.128
BHA	0.008	0.029	0.063	0.109	0.168
BHB	0.008	0.029	0.063	0.109	0.168
BTX	0.008	0.029	0.063	0.109	0.168
BAI	0.004	0.015	0.032	0.055	0.084
BTC	0.004	0.014	0.030	0.052	0.080
BAR	0.004	0.015	0.032	0.055	0.084
BMH	0.004	0.014	0.030	0.052	0.079
BAD	0.007	0.028	0.061	0.106	0.163
BTR	0.007	0.028	0.061	0.106	0.163
BFA	0.008	0.028	0.062	0.107	0.165
BAE	0.008	0.028	0.062	0.107	0.165
CPO					
CBT					
CPS					
CSS					
CRB	0.004	0.015	0.032	0.056	0.086
CRF					
CSA					
NCT	0.004	0.013	0.029	0.050	0.076
CCT	0.003	0.013	0.028	0.048	0.074
CWD	0.003	0.013	0.028	0.048	0.074
CRS	0.004	0.013	0.028	0.048	0.074
CRS					
CFP	0.004	0.013	0.028	0.048	0.074
CSC					
CAX					
CTA	0.004	0.016	0.035	0.060	0.093
CCH	0.003	0.013	0.028	0.048	0.074
CHA	0.004	0.014	0.031	0.053	0.082
DAT	0.003	0.013	0.028	0.048	0.074
DBX	0.004	0.013	0.028	0.049	0.075
DCH	0.011	0.042	0.092	0.161	0.247
DEE	0.004	0.013	0.028	0.048	0.074
DCM					
DDE					
DAD					
DTI					
DPX	0.009	0.032	0.071	0.123	0.190
DPU	0.008	0.029	0.064	0.111	0.171
DMX	0.009	0.032	0.071	0.123	0.190
DCN					
DEA	0.003	0.013	0.028	0.048	0.074
DEN	0.004	0.014	0.031	0.054	0.083
DET	0.003	0.013	0.028	0.048	0.074
DEH					
DBU	0.004	0.014	0.031	0.053	0.082
DIP	0.003	0.013	0.028	0.048	0.074

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ACETIC ACID
 ACETIC ANHYDRIDE
 ACETONITRILE
 ACRYLIC ACID
 ACRYLONITRILE
 ADIPONITRILE
 ALUMINUM SULFATE SOLUTION
 AMINOETHYLETHANOLAMINE
 AMMONIUM BISULFITE SOLN (70% OR LESS)
 AMMONIUM HYDROXIDE (28% OR LESS NH3)
 ANTHRACENE OIL (COAL TAR FRACTION)
 BENZENE
 BENZENE HYDROCARBON MIXTURES (W/ACETYLENES) (W/10% BENZENE OR MORE)
 BENZENE HYDROCARBON MIXTURES (W/10% BENZENE OR MORE)
 BENZENE, TOLUENE, XYLENE MIXTURES (HAVING 10% BENZENE OR MORE)
 iso-BUTYL ACRYLATE
 n-BUTYL ACRYLATE
 BUTYL ACRYLATE (SEE ISO- & N- BUTYL ACRYLATE)
 BUTYL METHACRYLATE
 iso-BUTYRALDEHYDE
 n-BUTYRALDEHYDE
 BUTYRALDEHYDES (CRUDE)
 BUTYRALDEHYDE (ISO-, N-)
 CAMPHOR OIL (LIGHT)
 CARBON TETRACHLORIDE
 CAUSTIC POTASH SOLUTION
 CAUSTIC SODA SOLUTION
 CHLOROBENZENE
 CHLOROFORM
 CHLOROSULFONIC ACID
 COAL TAR NAPHTHA SOLVENT
 CREOSOTE (COAL TAR)
 CREOSOTE (WOOD)
 CRESOLS (ALL ISOMERS)
 CRESOLS WITH LESS THAN 5% PHENOL (SEE CRESOLS (ALL ISOMERS))
 CRESOLS WITH 5% OR MORE PHENOL (SEE PHENOL)
 CRESYLATE SPENT CAUSTIC
 CRESYLIC ACID, SODIUM SALT SOLUTION, SEE CRESYLATE SPENT CAUSTIC
 CROTONALDEHYDE
 CYCLOHEXANONE
 CYCLOHEXYLAMINE
 DECYL ACRYLATE (iso-, n-)
 DICHLOROBENZENE (ALL ISOMERS)
 1,1-DICHLOROETHANE
 2,2-DICHLOROETHYL ETHER
 DICHLOROMETHANE (ALSO KNOWN AS METHYLENE CHLORIDE)
 2,4-DICHLOROPHENOXYACETIC ACID DIETHANOLAMINE SALT SOLUTION
 2,4-DICHLOROPHENOXYACETIC ACID, DIMETHYLAMINE SALT SOLUTION
 2,4-DICHLOROPHENOXYACETIC ACID, TRIISOPROPANOLAMINE SALT SOLUTION
 1,1,1,2- OR 1,3- DICHLOROPROPANE
 1,3-DICHLOROPROPENE
 DICHLOROPROPENE, DICHLOROPROPANE MIXTURES
 2,2-DICHLOROPROPIONIC ACID
 DIETHANOLAMINE
 DIETHYLAMINE
 DIETHYLENETRIAMINE
 DIETHYL ETHER, SEE ETHYL ETHER
 DIISOBUTYLAMINE
 DIISOPROPANOLAMINE

BARGE: C9706: CONOCO, INC.; E344

(SEE "TABLE IV" FOR APPLICABLE CONDITIONS)

TABLE V: SUMMARY OF PRESSURE DROP FROM MOST REMOTE CARGO TANK TO VAPOR SHORE CONNECTION

C H R I S	CARGO		20.0%	40.0%	60.0%	80.0%	100.0
			MAX LIQUID TRANSF RATE (MLTR)	MAX LIQUID TRANSF RATE (MLTR)	MAX LIQUID TRANSF RATE (MLTR)	MAX LIQUID TRANSF RATE (MLTR)	MAX LIQUID TRANSF RATE (MLTR)
			1,000 (BBL/ HR)	2,000 (BBL/ HR)	3,000 (BBL/ HR)	4,000 (BBL/ HR)	5,000 (BBL/ HR)
	DIISOPROPYLAMINE	DIA	0.006	0.022	0.048	0.085	0.130
	N,N-DIMETHYLACETAMIDE	DAC	0.004	0.013	0.028	0.049	0.076
	DIMETHYLETHANOLAMINE	DMB	0.004	0.014	0.030	0.052	0.079
	DIMETHYLFORMAMIDE	DMF	0.004	0.013	0.029	0.050	0.076
	1,4-DIOXANE	DOX	0.004	0.017	0.036	0.062	0.096
	DI-N-PROPYLAMINE	DNA	0.004	0.016	0.036	0.062	0.095
	ETHANOLAMINE	MEA	0.003	0.013	0.028	0.048	0.074
	ETHYL ACRYLATE	EAC	0.005	0.018	0.038	0.067	0.103
	ETHYLAMINE SOLUTION (72% OR LESS)	EAN	0.008	0.032	0.070	0.121	0.187
	N-ETHYLBUTYLAMINE	EBA	0.004	0.016	0.034	0.059	0.091
	N-ETHYLCYCLOHEXYLAMINE	ECC	0.004	0.014	0.031	0.054	0.082
	ETHYLENE CYANOHYDRIN	ETC	0.003	0.013	0.028	0.048	0.073
	ETHYLENEDIAMINE	EDA	0.004	0.014	0.030	0.052	0.080
	ETHYLENE DIBROMIDE	EDB					
	ETHYLENE DICHLORIDE	EDC	0.006	0.023	0.050	0.086	0.133
	ETHYLENE GLYCOL PROPYL ETHER	EGP	0.004	0.015	0.032	0.055	0.085
	2-ETHYLHEXYL ACRYLATE	EAI	0.003	0.013	0.028	0.048	0.074
	ETHYLIDENE NORBORNENE	ENB	0.004	0.014	0.030	0.051	0.079
	ETHYL METHACRYLATE	ETM	0.004	0.016	0.034	0.058	0.090
	2-ETHYL-3-PROPYLACROLEIN	EPA	0.004	0.013	0.028	0.049	0.076
	FERRIC CHLORIDE SOLUTIONS	FCS					
	FORMALDEHYDE SOLUTION (37% TO 50%)	FMS	0.003	0.013	0.028	0.048	0.074
	FORMIC ACID	FMA	0.004	0.015	0.032	0.056	0.085
	FURFURAL	FFA	0.004	0.013	0.028	0.049	0.075
	GLUTARALDEHYDE SOLUTION (50% OR LESS)	GTA					
	HEXAMETHYLENEDIAMINE SOLUTION	HMC	0.003	0.013	0.028	0.048	0.074
	HEXAMETHYLENEIMINE	HMI	0.004	0.013	0.028	0.049	0.075
	HYDROCHLORIC ACID SPENT (15% OR LESS)	HCS					
	ISOPENTALDEHYDE (MIXED ISOMERS) (SEE VALERALDEHYDE (ISO-, N-))						
	ISOPRENE	IPR	0.019	0.072	0.158	0.277	0.428
	KRAFT PULPING LIQUORS (FREE ALKALI CONTENT >= 3%) (INCL'G: BLACK, GREEN OR WHITE)	KPL					
	MESITYL OXIDE	MSO	0.004	0.014	0.031	0.054	0.083
	METHYL ACRYLATE	MAM	0.006	0.022	0.047	0.082	0.126
	METHYLCYCLOPENTADIENE DIMER	MCK	0.003	0.013	0.028	0.048	0.074
	METHYL DIETHANOLAMINE	MDE	0.004	0.013	0.028	0.049	0.075
	2-METHYL-5-ETHYLPYRIDINE	MEP	0.004	0.013	0.029	0.050	0.076
	METHYLENE CHLORIDE (SEE DICHLOROMETHANE)						
	METHYL METHACRYLATE	MMM	0.005	0.018	0.038	0.066	0.103
	2-METHYLPYRIDINE	MPR	0.004	0.014	0.030	0.052	0.080
	alpha-METHYLSTYRENE	MSR	0.004	0.014	0.030	0.052	0.080
	MORPHOLINE	MPL	0.004	0.014	0.031	0.054	0.083
	NITRIC ACID (70% OR LESS)	NCD					
	NITROPROPANE (-1, OR -2)	NPM	0.004	0.015	0.032	0.056	0.086
	OCTYL NITRATES (ALL ISOMERS)	ONE	0.004	0.014	0.030	0.053	0.081
	OLEUM	OLM	0.003	0.013	0.028	0.048	0.074
	PENTACHLOROETHANE	PCE					
	1, 3-PENTADIENE	PDE	0.014	0.051	0.112	0.197	0.304
	PERCHLOROETHYLENE (SAME AS TETRACHLOROETHYLENE)	PER					
	PHOSPHORIC ACID	PAC					
	POLYETHYLENE POLYAMINES	PEB	0.003	0.013	0.028	0.048	0.074
	POLYMETHYLENE POLYPHENYL ISOCYANATE	PPI	0.003	0.013	0.028	0.048	0.073
	POTASSIUM HYDROXIDE SOLUTION (SEE CAUSTIC POTASH SOLUTION)						
	iso-PROPANOLAMINE	MPA	0.004	0.013	0.028	0.048	0.074
	PROPANOLAMINE (iso-, n-)	PAX	0.004	0.013	0.028	0.048	0.074
	PROPIONIC ACID	PNA	0.004	0.013	0.029	0.050	0.076
	iso-PROPYLAMINE	IPP	0.017	0.063	0.138	0.241	0.373
	iso-PROPYL ETHER	IFE	0.008	0.031	0.068	0.119	0.183
	PYRIDINE	PRD	0.004	0.015	0.033	0.057	0.087
	SODIUM ALUMINATE SOLUTION	SAU					
	SODIUM CHLORATE SOLUTION (50% OR LESS)	SDD					
	SODIUM DICHROMATE SOL'N (70% OR LESS)	SDL					
	SODIUM HYDROXIDE SOLUTION (SEE CAUSTIC SODA SOLUTION)						

BARGE: C9706: CONOCO, INC., E344

TABLE V: SUMMARY OF PRESSURE DROP FROM MOST REMOTE CARGO TANK TO VAPOR SHORE CONNECTION

C H R I S	CARGO	20.0%	40.0%	60.0%	80.0%	100.0
		MAX	MAX	MAX	MAX	MAX
		LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
		TRANSF	TRANSF	TRANSF	TRANSF	TRANSF
		RATE	RATE	RATE	RATE	RATE
		(MLTR)	(MLTR)	(MLTR)	(MLTR)	(MLTR)
		1,000	2,000	3,000	4,000	5,000
		(BBL/ HR)	(BBL/ HR)	(BBL/ HR)	(BBL/ HR)	(BBL/ HR)
	SODIUM HYPOCHLORITE SOL'N (15% OR LESS)					
	SODIUM SULFIDE, HYDROSULFIDE SOLUTIONS (H ₂ S 15 PPM OR LESS)					
	SODIUM SULFIDE HYDROSULFIDE SOLUTIONS (15 PPM<H ₂ S<200 PPM)					
	SODIUM SULFIDE HYDROSULFIDE SOLUTIONS (H ₂ S GREATER THAN 200 PPM)					
	SODIUM THIOCYANATE SOLUTION (56% OR LESS)					
	STYRENE MONOMER					
	SULFURIC ACID					
	SULFURIC ACID, SPENT					
	1,1,2,2-TETRACHLOROETHANE (ACETYLENE TETRACHLORIDE)					
	TETRAETHYLENEPENTAMINE					
	TETRAHYDROFURAN					
	1,1,2-TRICHLOROETHANE (VINYL TRICHLORIDE)					
	TRICHLOROETHANE (SEE 1,1,2-TRICHLOROETHANE)					
	TRICHLOROETHYLENE					
	1,2,3-TRICHLOROPROPANE					
	TRIETHANOLAMINE					
	TRIETHYLAMINE					
	TRIETHYLENETETRAMINE					
	UREA, AMMONIUM NITRATE SOL'N (CONTAINING MORE THAN 2% NH ₃)					
	VALERALDEHYDE (iso-, n-)					
	VALERALDEHYDE (iso-)					
	VALERALDEHYDE (n-)					
	VANILLAN BLACK LIQUOR (FREE ALKALI CONTENT 3% OR MORE)					
	VINYL ACETATE					
	VINYLTOLUENE					
	SHR	0.004	0.014	0.030	0.052	0.079
	SSH	0.003	0.013	0.028	0.048	0.074
	SSI	0.003	0.013	0.028	0.048	0.073
	SSJ	0.003	0.013	0.028	0.048	0.073
	STS	0.003	0.013	0.028	0.048	0.073
	STY	0.003	0.013	0.028	0.048	0.073
	SFA	0.003	0.013	0.028	0.048	0.073
	SAC	0.003	0.013	0.028	0.048	0.073
	TEC	0.003	0.013	0.028	0.048	0.073
	TTP	0.003	0.013	0.028	0.048	0.073
	THF	0.005	0.020	0.044	0.076	0.117
	TCM	0.004	0.016	0.035	0.060	0.093
	TCL	0.007	0.024	0.053	0.092	0.142
	TCN	0.004	0.013	0.029	0.050	0.077
	TEA	0.003	0.013	0.028	0.048	0.074
	TEN	0.005	0.019	0.041	0.071	0.110
	TET	0.003	0.013	0.028	0.048	0.074
	UAS	0.006	0.024	0.052	0.091	0.140
	IVA	0.006	0.024	0.052	0.091	0.140
	VAL	0.003	0.013	0.028	0.048	0.074
	VBL	0.007	0.026	0.056	0.098	0.151
	VAM	0.007	0.026	0.056	0.098	0.151
	VNT	0.004	0.013	0.028	0.049	0.075

BARGE: C9706: CONOCO, INC.; E344

(SEE "TABLE IV" FOR APPLICABLE CONDITIONS)

TABLE V: SUMMARY OF PRESSURE DROP FROM MOST REMOTE CARGO TANK TO VAPOR SHORE CONNECTION

C H R I S	CARGO		20.0%	40.0%	60.0%	80.0%	100.0
			MAX	MAX	MAX	MAX	MAX
			LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
			TRANSF	TRANSF	TRANSF	TRANSF	TRANSF
S			RATE	RATE	RATE	RATE	RATE
			(MLTR)	(MLTR)	(MLTR)	(MLTR)	(MLTR)
			1,000	2,000	3,000	4,000	5,000
			(BBL/ HR)	(BBL/ HR)	(BBL/ HR)	(BBL/ HR)	(BBL/ HR)

	METHYL STYRENE	MIA					
	METHYL STYRENE, INDENES, ALKYL BENZENE MIXTURES	MCY	0.005	0.018	0.040	0.070	0.107
	METHYLCYCLOHEXANE						
	METHYLHEXANE (SAME AS HEPTANE)						
	MONOETHANOLAMINE	MEA	0.004	0.013	0.028	0.048	0.074
	MONOISOPROPANOLAMINE		0.004	0.013	0.028	0.049	0.075
	NAPHTHALENE (MOLTEN)	NTM	0.003	0.013	0.028	0.048	0.074
	NEODECANOIC ACID	NEA	0.003	0.013	0.028	0.048	0.074
	NITRILOTRIACETIC ACID	NAA					
	NITROPHENOL (MOLTEN)	NTP					
	NITROPROPANE (60%), NITROETHANE (40%) MIXTURE	NNM	0.004	0.015	0.033	0.056	0.087
	NITROTOLUENE (o-, p-)	NIT	0.003	0.013	0.028	0.048	0.074
	PARALDEHYDE	PDH	0.012	0.045	0.099	0.172	0.267
	POLYGLYCERINE, SODIUM SALT SOLN (CONTAINING 3% OR MORE SODIUM HYDROXIE)	PGS					
	PROPIONALDEHYDE	PAD	0.010	0.036	0.079	0.137	0.212
	PROPIONIC ANHYDRIDE	PAH	0.004	0.013	0.028	0.049	0.075
	PROPIONITRILE	PCN	0.004	0.014	0.031	0.053	0.081
	PROPYLAMINE (n-)	PRA	0.010	0.036	0.079	0.138	0.213
	PROPYLBENZENE		0.003	0.012	0.026	0.045	0.069
	PYROLYSIS GASOLINE (GREATER THAN 5% BENZENE)	GPY	0.008	0.029	0.063	0.109	0.168
	PYROLYSIS RESIDUAL FUELS						
	SEWAGE, RAW						
	SODIUM SULFIDE (SOLID IN WATER)	SNR					
	STYRENE	SDS					
	STYRENE CRUDE	STY	0.004	0.014	0.030	0.052	0.079
	STYRENE TAR	STX	0.004	0.014	0.030	0.052	0.079
	TETRAMETHYLBENZENE (1,2,3,5-)	STT					
	TOLUIDINE (o-)	TTB	0.004	0.013	0.028	0.049	0.076
	TRICHLOROBENZENE (1,2,4-)	TLI	0.003	0.013	0.028	0.048	0.074
	TRIISOPROPANOLAMINE SALT OF 2,4-DICHLOROPHENOXY ACETIC ACID SOL'N	TCB	0.004	0.013	0.028	0.048	0.074
	TRIPHENYLBORANE						
	UNDECANOIC ACID	TPE					
	HYDROCARBON 5-9	UDA	0.003	0.013	0.028	0.048	0.073
		HFN	0.006	0.024	0.052	0.091	0.140

BARGE: C9706: CONOCO, INC.; E344

(SEE "TABLE IV" FOR APPLICABLE CONDITIONS)

TABLE V: SUMMARY OF PRESSURE DROP FROM MOST REMOTE CARGO TANK TO VAPOR SHORE CONNECTION

		20.0%	40.0%	60.0%	80.0%	100.0%
C H R I S	MAX	MAX	MAX	MAX	MAX	MAX
	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
	TRANSF	TRANSF	TRANSF	TRANSF	TRANSF	TRANSF
	RATE	RATE	RATE	RATE	RATE	RATE
		(MLTR)	(MLTR)	(MLTR)	(MLTR)	(MLTR)
CARGO		1,000	2,000	3,000	4,000	5,000
		(BBL/ HR)	(BBL/ HR)	(BBL/ HR)	(BBL/ HR)	(BBL/ HR)

46 CFR SUBCHAPTER D, TABLE 30.25-1		***				

Acetone						
Acetophenone	ACT	0.008	0.028	0.062	0.107	0.166
Acetyl Tributyl Citrate	ACP	0.004	0.014	0.031	0.054	0.083
Acrylonitrile-Styrene Copolymer dispersion in Polyether Polyol						
Alcohols (C13 and above)	ALE					
Alcoholic beverages, N.O.S.	ALY					
Alcohol (C6 - C17) (secondary) Poly(3-6)ethoxylates						
Alcohol (C12 - C15) Poly(1-3)ethoxylates						
Alcohol (C12 - C15) Poly(3-11)ethoxylates						
Alkenylsuccinic acid						
Alkenylsuccinic Anhydride						
Alkyl (C9 - C17) Benzenes						
Alkylbenzenesulfonic acid (4% or less)	AKB					
Alkyl Phthalates (n-)	ABS					
Alkyl Succinate Formaldehyde Hydr- oxyamino condensate (3.2% or less)						
Aminoethyldiethanolamine, Aminoethylethanolamine solution						
Amyl Acetate (commercial, iso-, n-, sec-)						
AMYL ACETATE (n-)	AEC	0.005	0.019	0.042	0.073	0.112
AMYL ACETATE (iso-)	AML	0.004	0.014	0.030	0.052	0.079
Amyl alcohol (iso-, n-, sec-, primary) (SEE ALSO IAA)	IAT	0.004	0.014	0.030	0.052	0.079
Amyl alcohol (n-)	AAI	0.004	0.013	0.029	0.050	0.077
Amyl alcohol (tert-)	AAN	0.004	0.013	0.029	0.050	0.077
AMYL ALCOHOL, PRIMARY	AAI					
AMYL ALCOHOL, (sec-)	APM	0.004	0.013	0.029	0.050	0.077
Amylene	ASE	0.004	0.013	0.029	0.050	0.077
AMYL ALCOHOL, (iso-)	AMZ					
Amyl Methyl Ketone	IAA	0.004	0.013	0.029	0.050	0.077
Amyl Tallate	AMK					
Asphalt						
ASPHALT BLENDING STOCKS: Roofers flux	ASP					
ASPHALT BLENDING STOCKS: Straight run residue	ARF					
Behenyl alcohol	ASR					
Benzene Tricarboxylic acid Trioctyl Ester						
Benzyl alcohol						
Bicyclic Terpenel Polyamide salt	BAL	0.004	0.013	0.028	0.049	0.075
Brake fluid base mixtures (containing Poly(2-8)alkylene (C2-C3) glycols, Polyalkylglycols)	BFX					
Butane	BMK					
Butene, SEE BUTYLENE						
Butene Oligomer						
Butyl Acetate (iso-, n-)	BOL					
BUTYL ACETATE (N-)	BAX	0.004	0.014	0.031	0.054	0.083
Butyl Acetate (sec-)	BCN	0.004	0.015	0.032	0.056	0.086
Butyl alcohol (iso-, n-, sec-, tert-)	BTA	0.005	0.017	0.037	0.064	0.098
BUTYL ALCOHOL (ISO-)		0.004	0.014	0.031	0.054	0.082
BUTYL ALCOHOL (N-)	IAL	0.004	0.014	0.031	0.054	0.082
BUTYL ALCOHOL (SEC-)	BAN	0.004	0.014	0.029	0.051	0.078
BUTYL ALCOHOL (TERT-)	BAS	0.004	0.015	0.032	0.056	0.086
Butyl Benzyl Phthalate	BAT	0.005	0.018	0.039	0.067	0.103
Butylene	BPH	0.003	0.013	0.028	0.048	0.074
Butylene Glycol	BTN					
1,3-Butylene Glycol, SEE BUTYLENE GLYCOL	BUG					
Butylene Polyglycol, SEE BUTYLENE GLYCOL						
iso-Butyl Formate						
n-Butyl Formate						
Butyl Heptyl Ketone						
Butyl Methyl Ketone,SEE METHYL BUTYL KETONE	BHK					
Butyl Stearate						
Butyl Toluene						
Butyrolactone (gamma)	BUE	0.004	0.013	0.028	0.049	0.075
	BLA					

BARGE: C9706: CONOCO, INC.; E344

TABLE V: SUMMARY OF PRESSURE DROP FROM MOST REMOTE CARGO TANK TO VAPOR SHORE CONNECTION

C H R I S	CARGO	20.0%	40.0%	60.0%	80.0%	100.0%
		MAX	MAX	MAX	MAX	MAX
		LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
		TRANSF	TRANSF	TRANSF	TRANSF	TRANSF
		RATE	RATE	RATE	RATE	RATE
		(MLTR)	(MLTR)	(MLTR)	(MLTR)	(MLTR)
		1,000	2,000	3,000	4,000	5,000
		(BBL/	(BBL/	(BBL/	(BBL/	(BBL/
		HR)	HR)	HR)	HR)	HR)
	Calcium Alkylphenate					
	Calcium Alkyl Salicylate					
	Calcium Amino Nonyl Phenolate					
	Calcium Carboxylate					
	Caprolactam solutions					
	Carbon black base					
	Cetyl alcohol (HEXADECANOL) SEE ALCOHOLS (C13 AND ABOVE)					
	Cetyl-Stearal alcohol					
	Cleaning spirit (unleaded)					
	Coal tar					
	Cumene					
	Cycloaliphatic resins					
	Cyclohexane					
	Cyclohexanol					
	1,3-Cyclopentadiene dimer (molten)					
	Cyclopentadiene polymers, SEE 1,3-CYCLOPENTADIENE DIMER (MOLTEN)					
	Cymene (para-)					
	Decahydronaphthalene					
	Decaldehyde (iso-)					
	Decaldehyde (n-)					
	Decane					
	Decene					
	Decyl alcohol (all isomers) (DECANOL)					
	DECYL ALCOHOL (iso-)					
	DECYL ALCOHOL (n-)					
	Decylbenzene (n-)					
	Detergent Alkylate					
	Diacetone alcohol					
	Dialkyl (C10-C14) Benzenes					
	Dialkyl (C7-C13) Phthalates					
	Dibutyl Carbinol					
	Dibutyl Phthalate (ortho-)					
	Dicyclopentadiene, SEE 1,3-CYCLOPENTADIENE DIMER (MOLTEN)					
	Diethylbenzene					
	Diethylene Glycol					
	Diethylene Glycol Butyl Ether					
	Diethylene Glycol Butyl Ether Acetate					
	Diethylene Glycol Dibutyl Ether					
	Diethylene Glycol Diethyl Ether					
	Diethylene Glycol Ethyl Ether					
	Diethylene Glycol Ethyl Ether Acetate					
	Diethylene Glycol Methyl Ether					
	Diethylene Glycol Methyl Ether Acetate					
	Diethylene Glycol Phenyl Ether					
	Diethylene Glycol Phthalate					
	Di-(2-ethylhexyl)adipate					
	Di-(2-ethylhexyl)phthalate					
	Diethyl Phthalate					
	Diglycidyl Ether of Bisphenol A					
	Diheptyl Phthalate					
	Dihexyl Phthalate					
	Diisobutylcarbinol					
	Diisobutylene					
	Diisobutyl Ketone					
	Diisobutyl Phthalate					
	Diisodecyl Phthalate					
	Diisononyl Adipate					
	Diisononyl Phthalate					
	Diisooctyl Phthalate					
	Diisopropylbenzene (all isomers)					
	Diisopropyl Naphthalene					
	Dimethyl Adipate					
	CLS	0.004	0.013	0.028	0.048	0.074
	COR					
	CUM	0.004	0.014	0.031	0.054	0.084
	CHX	0.006	0.022	0.048	0.085	0.130
	CHN	0.004	0.013	0.028	0.049	0.075
	CPD	0.004	0.014	0.029	0.051	0.078
	CMF	0.004	0.013	0.028	0.049	0.075
	DHN	0.004	0.013	0.028	0.049	0.075
	IDA	0.003	0.013	0.028	0.048	0.074
	DAL	0.003	0.013	0.028	0.048	0.073
	DDC					
	DCE	0.004	0.013	0.028	0.049	0.076
	DAX	0.003	0.013	0.028	0.048	0.074
	ISA	0.003	0.013	0.028	0.048	0.074
	DAN	0.003	0.013	0.028	0.048	0.074
	DBZ	0.003	0.013	0.028	0.048	0.074
	DAA	0.004	0.013	0.028	0.049	0.075
	DAB					
	DAH					
	DPA					
	DPT	0.004	0.014	0.029	0.051	0.078
	DEB	0.004	0.013	0.028	0.049	0.075
	DEG	0.003	0.013	0.028	0.048	0.074
	DME	0.003	0.013	0.028	0.048	0.074
	DEM					
	DIG					
	DGE					
	DGA	0.003	0.013	0.028	0.048	0.074
	DGM	0.003	0.013	0.028	0.048	0.074
	DGR					
	DGP					
	DGL					
	DEH					
	DIE					
	DPH					
	BDE					
	DHP					
	DHA					
	DBC	0.004	0.013	0.028	0.049	0.075
	DBL	0.005	0.018	0.040	0.069	0.106
	DIK	0.004	0.013	0.029	0.050	0.077
	DIT					
	DID					
	DNY					
	DIN					
	DIO					
	DIX	0.004	0.013	0.028	0.048	0.074
	DII					
	DLA					

BARGE: C9706: CONOCO, INC.; E344

(SEE "TABLE IV" FOR APPLICABLE CONDITIONS)

TABLE V: SUMMARY OF PRESSURE DROP FROM MOST REMOTE CARGO TANK TO VAPOR SHORE CONNECTION

C H R I S	CARGO		20.0%	40.0%	60.0%	80.0%	100.0
			MAX	MAX	MAX	MAX	MAX
			LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
			TRANSF	TRANSF	TRANSF	TRANSF	TRANSF
			RATE	RATE	RATE	RATE	RATE
			(MLTR)	(MLTR)	(MLTR)	(MLTR)	(MLTR)
			1,000	2,000	3,000	4,000	5,000
			(BBL/ HR)	(BBL/ HR)	(BBL/ HR)	(BBL/ HR)	(BBL/ HR)

	Dimethylbenzene	DTG					
	Dimethyl Glutarate	DTL	0.003	0.013	0.028	0.048	0.073
	Dimethyl Phthalate	DMP					
	Dimethyl Polysiloxane	DDI					
	2,2-Dimethylpropane-1,3-diol	DSE					
	Dimethyl Succinate	DIF	0.004	0.013	0.028	0.048	0.074
	Dinonyl Phthalate	DOP	0.003	0.013	0.028	0.048	0.073
	Di(octylphenyl)amine	DPN	0.004	0.013	0.028	0.049	0.075
	Diocetyl Phthalate	DIL	0.003	0.013	0.028	0.048	0.074
	Dipentene	DDO	0.003	0.013	0.028	0.048	0.074
	Diphenyl	DPE	0.003	0.013	0.028	0.048	0.074
	Diphenyl, Diphenyl Ether mixture	DOB					
	Diphenyl Ether	DPG	0.004	0.013	0.028	0.049	0.075
	Diphenyl Ether, Biphenyl Ether mixture	DGY					
	Dipropylene Glycol	DFY					
	Dipropylene Glycol Dibenzoate	DFF	0.005	0.018	0.040	0.069	0.106
	Dipropylene Glycol Methyl Ether	DSR	0.005	0.018	0.040	0.069	0.106
	DISTILLATES: Flashed feed stocks	DTP					
	DISTILLATES: Straight run	DUP					
	Ditridecyl Phthalate	DOC					
	Diundecyl Phthalate	DDN					
	Dodecane (all isomers)	DOZ	0.003	0.013	0.028	0.048	0.074
	Dodecanol	DOD	0.003	0.013	0.028	0.048	0.074
	Dodecene (all isomers)	DDB	0.012	0.044	0.097	0.169	0.262
	DODECENE	DOL					
	Dodecylbenzene						
	Dodecyl Phenol						
	Drilling mud (low toxicity) (if flammable or combustible)/						
	Epoxylated linear alcohols, C11-C15						
	Ethane	ETH					
	2-Ethoxyethanol	EEO					
	2-Ethoxyethyl Acetate	EEA					
	Ethoxylated alcohols, C11-C15, SEE THE ALCOHOL POLYETHOXYLATES						
	Ethoxy Triglycol (crude)	ETG	0.003	0.013	0.028	0.048	0.073
	Ethyl Acetate	ETA	0.006	0.023	0.050	0.087	0.133
	Ethyl Acetoacetate	EAA	0.004	0.013	0.029	0.050	0.077
	Ethyl alcohol (ETHANOL)	EAL	0.004	0.016	0.035	0.061	0.094
	Ethyl Amyl Ketone	EAK					
	Ethyl Benzene	ETB	0.004	0.014	0.031	0.053	0.082
	Ethyl Butanol	EBT	0.004	0.013	0.028	0.049	0.075
	Ethyl Butyrate	EBR	0.004	0.016	0.034	0.058	0.090
	Ethyl Cyclohexane	ECY	0.004	0.014	0.031	0.053	0.081
	Ethylene	ETL					
	Ethylene Carbonate						
	Ethylene Glycol	EGL	0.003	0.013	0.028	0.048	0.073
	Ethylene Glycol Acetate	EGO					
	Ethylene Glycol Butyl Ether	EGM					
	ETHYLENE GLYCOL BUTYL ETHER ACETATE	EMA	0.004	0.013	0.028	0.049	0.075
	Ethylene Glycol Ether Acetate						
	Ethylene Glycol Tert-Butyl Ether						
	Ethylene Glycol Diacetate						
	Ethylene Glycol Dibutyl Ether	EGY	0.003	0.013	0.028	0.048	0.074
	Ethylene Glycol Ethyl Ether, SEE 2-ETHOXYETHANOL	EGB					
	Ethylene Glycol Ethyl Ether Acetate, SEE 2-ETHOXYETHYL ACETATE	EGF					
	Ethylene Glycol Isopropyl Ether	EGA					
	Ethylene Glycol Methyl Butyl Ether	EGI					
	Ethylene Glycol Methyl Ether						
	Ethylene Glycol Methyl Ether Acetate	EME	0.003	0.013	0.028	0.048	0.074
	Ethylene Glycol Phenyl Ether	EGT					
	Ethylene Glycol Phenyl Ether, Diethylene Glycol Phenyl Ether mixture	EPE	0.003	0.013	0.028	0.048	0.074
	Ethylene-Propylene Copolymer (in liquid mixtures)	EDX					
	Ethyl-3-Ethoxypropionate	EEP					

BARGE: C9706: CONOCO, INC.; E344

(SEE "TABLE IV" FOR APPLICABLE CONDITIONS)

TABLE V: SUMMARY OF PRESSURE DROP FROM MOST REMOTE CARGO TANK TO VAPOR SHORE CONNECTION

CARGO		20.0% MAX LIQUID TRANSF RATE (MLTR)	40.0% MAX LIQUID TRANSF RATE (MLTR)	60.0% MAX LIQUID TRANSF RATE (MLTR)	80.0% MAX LIQUID TRANSF RATE (MLTR)	100.0 MAX LIQUID TRANSF RATE (MLTR)
2-Ethylhexaldehyde, SEE OCTYL ALDEHYDES	EHA	0.004	0.013	0.029	0.050	0.076
2-Ethylhexanoic acid	EHO					
2-Ethylhexanol, SEE OCTANOL (ALL ISOMERS)	EHX	0.003	0.013	0.028	0.048	0.074
Ethylhexoic acid, SEE 2-ETHYLHEXANOIC ACID						
Ethyl Hexyl Phthalate (SEE ALSO DI 2-ETHYLHEXYL PHTHALATE)	EHE					
Ethyl Hexyl Tallate	EHT					
Ethyl Propionate	EPR	0.004	0.016	0.035	0.061	0.094
Ethyl Toluene	ETE	0.004	0.014	0.029	0.051	0.078
Fatty acid (saturated, C13 and above)						
Fatty acid Amides						
Formamide	FAM	0.003	0.013	0.028	0.048	0.074
Furfuryl Alcohol	FAL	0.004	0.013	0.028	0.048	0.074
Gas oil, cracked	GOC					
GASOLINE BLENDING STOCKS: Alkylates	GAK	0.014	0.052	0.114	0.200	0.309
GASOLINE BLENDING STOCKS: Reformates	GRF	0.014	0.052	0.114	0.200	0.309
GASOLINES: Automotive (containing not over 4.23 grams lead per gallon)	GAT	0.014	0.052	0.114	0.200	0.309
GASOLINES: Aviation (containing not over 4.86 grams lead per gallon) Aviation	GAV	0.014	0.052	0.114	0.200	0.309
GASOLINES: Casinghead (natural)	GCS	0.014	0.052	0.114	0.200	0.309
GASOLINES: Polymer	GPL	0.014	0.052	0.114	0.200	0.309
GASOLINES: Straight run	GSR	0.014	0.052	0.114	0.200	0.309
Glycerine	GCR	0.003	0.013	0.028	0.048	0.073
Glycerol, SEE GLYCERINE						
Glycerol Polyalkoxylate						
Glycerol Triacetate						
Glycidyl Ester of Tertiary Carboxylic acid, SEE GLYCIDYL ESTER OF TRIDECYL ACETIC ACID	GLT					
Glycidyl Ester of Tridecyl Acetic acid						
Glycidyl Ester of Versatic acid, SEE GLYCIDYL ESTER OF TRIDECYL ACETIC ACID						
Glycol Diacetate, SEE ETHYLENE GLYCOL DIACETATE						
Glycols, Resins and Solvents mixtures						
Gylcol Triacetate, SEE GLYCERYL TRIACETATE						
Glyoxal solution (40% or less)						
Grease						
Heptadecane						
Heptane (all isomers) (METHYHEXANE)	HMX	0.005	0.019	0.041	0.071	0.110
HEPTANE (N-)	HPT	0.005	0.019	0.041	0.071	0.110
Heptanoic acid	HEP	0.003	0.013	0.028	0.048	0.074
Heptanol (all isomers)	HTX	0.004	0.013	0.028	0.048	0.074
HEPTANOL	HTN	0.004	0.013	0.028	0.048	0.074
Heptene (all isomers)	HPX	0.005	0.020	0.043	0.075	0.115
HEPTENE (1-)	HTE	0.005	0.020	0.042	0.074	0.114
Heptyl Acetate	HPE	0.004	0.013	0.028	0.049	0.076
Herbicide (C15 -H22 -NO2 -CI), SEE METOLACHLOR						
Hexaethylene Glycol						
Hexamethylene Glycol						
Hexamethylenetetramine solutions	HTS					
Hexane (all isomers)	HXS	0.008	0.029	0.064	0.112	0.172
HEXANE	HXA	0.008	0.029	0.064	0.112	0.172
Hexanoic acid	HXO	0.003	0.013	0.028	0.048	0.074
Hexanol	HXN	0.004	0.015	0.033	0.057	0.088
Hexene (all isomers)	HEX	0.008	0.031	0.069	0.120	0.184
HEXENE (1-)	HXE	0.009	0.032	0.070	0.122	0.188
HEXENE (2-)	HXT	0.009	0.032	0.070	0.122	0.188
Hexyl Acetate	HAE					
Hexylene Glycol	HXG	0.003	0.013	0.028	0.048	0.073
Hog Grease, SEE LARD						
2-Hydroxy-4-(methylthio)butanoic acid	HBA					
HYDROCARBON 5-9 (MOVED TO SUB-O, NON TABLE 151, 6/24/95)	HFN					
Hydroxy terminated Polybutadiene, SEE POLYBUTADIENE, HYDROXYL TERMINATED/						
Isophorone	IPH	0.003	0.013	0.028	0.048	0.074
JET FUELS: JP-1 (Kerosene)	JPO	0.004	0.013	0.029	0.049	0.076
JET FUELS: JP-3	JPT	0.012	0.046	0.100	0.175	0.270
JET FUELS: JP-4	JPF	0.006	0.023	0.050	0.086	0.133

BARGE: C9706: CONOCO, INC.; E344

(SEE "TABLE IV" FOR APPLICABLE CONDITIONS)

TABLE V: SUMMARY OF PRESSURE DROP FROM MOST REMOTE CARGO TANK TO VAPOR SHORE CONNECTION

CARGO	C H R I S	20.0% MAX LIQUID TRANSF RATE (MLTR)	40.0% MAX LIQUID TRANSF RATE (MLTR)	60.0% MAX LIQUID TRANSF RATE (MLTR)	80.0% MAX LIQUID TRANSF RATE (MLTR)	100.0% MAX LIQUID TRANSF RATE (MLTR)
		1,000 (BBL/ HR)	2,000 (BBL/ HR)	3,000 (BBL/ HR)	4,000 (BBL/ HR)	5,000 (BBL/ HR)
JET FUELS: JP-5 (Kerosene, heavy)	***					
JET FUELS: JP-8	JPV	0.004	0.013	0.028	0.049	0.075
Kerosene	JPE					
Lactic acid	KRS	0.004	0.013	0.029	0.050	0.076
Lard						
Latex, liquid synthetic, including: Styrene-Butadien rubber	LLS					
Latex, liquid synthetic, including: Carboxylated Styrene-Butadien Copolymer						
Magnesium Nonyl Phenol Sulfide						
Magnesium Sulfonate	MSE					
Maleic Anhydride Copolymer						
2-Mercaptobenzothiazol (in liquid mixtures)						
Methane	MTH					
3-Methoxy-1-Butanol						
3-Methoxybutyl Acetate	MOA					
1-Methoxy-2-Propyl Acetate	MPO					
Methoxy Triglycol, SEE TRIETHYLENE GLYCOL METHYL ETHER	MTG					
Methyl Acetate	MTT	0.007	0.025	0.054	0.094	0.144
Methyl Acetoacetate	MAE					
Methyl alcohol (SEE METHANOL)	MAL	0.005	0.017	0.036	0.063	0.097
Methyl Amyl Acetate	MAC	0.004	0.014	0.030	0.052	0.080
Methyl Amyl alcohol	MAA	0.004	0.014	0.030	0.052	0.079
Methyl Amyl Ketone	MAK					
Methyl Butanol, SEE THE AMYL ALCOHOLS						
Methyl Butenol	MBL					
Methyl n-Butyl Ketone	MBK	0.004	0.015	0.033	0.057	0.087
Methyl Butynol	MBY					
Methyl Butyrate	MBU	0.004	0.016	0.034	0.059	0.092
Methyl Ethyl Ketone	MEK	0.006	0.021	0.045	0.079	0.121
Methyl Formal (DIMETHYL FORMAL)	MTF	0.013	0.051	0.111	0.194	0.300
Methyl Heptyl Ketone	MHK	0.004	0.013	0.028	0.049	0.075
Methyl Isobutyl Carbinol, SEE METHYL AMYL ALCOHOL	MIC					
Methyl Isobutyl Ketone	MIK	0.004	0.015	0.034	0.058	0.090
3-Methyl-3-Methoxybutanol						
3-Methyl-3-Methoxybutyl Acetate						
1-Methyl Naphthalene	MNA	0.003	0.013	0.028	0.048	0.074
Methyl Pentene						
2-METHYL-1-PENTENE	MPN	0.007	0.027	0.058	0.102	0.156
5-METHYL-1-PENTENE	MTN	0.009	0.033	0.072	0.125	0.192
N-Methyl-2-Pyrrolidone	MPY					
Methyl Tert-Butyl Ether (MTBE)	MBE	0.003	0.013	0.028	0.048	0.074
Metolachlor	MCO					
Mineral spirits	MNS	0.004	0.013	0.029	0.050	0.077
Myrcene	MRE	0.004	0.013	0.029	0.050	0.077
NAPHTHA: Aromatic (Having less than 10% Benzene)						
NAPHTHA: Cracking fraction						
NAPHTHA: Heavy						
NAPHTHA: Paraffinic						
NAPHTHA: Petroleum						
NAPHTHA: Solvent	PTN					
NAPHTHA: Stoddard solvent	NSV	0.004	0.013	0.029	0.050	0.076
NAPHTHA: Varnish makers' and painters' (75%)	NSS	0.004	0.013	0.029	0.050	0.077
Naphthalene Sulfonic acid-Formaldehyde Copolymer, Sodium salt solution	NVM	0.004	0.013	0.029	0.050	0.077
Naphthenic acid	NFS					
Nonane (all isomers)	NTI					
NONANE	NAX	0.004	0.014	0.029	0.051	0.078
Nonanoic acid (all isomers)	NAN	0.004	0.014	0.029	0.051	0.078
Nonanoic, Tridecanoic acid mixture	NNA					
Nonene						
Nonyl alcohol (all isomers)	NON	0.004	0.014	0.030	0.052	0.079
NONYL ALCOHOL	NNS	0.004	0.013	0.028	0.049	0.075
NONYL ALCOHOL (iso-)	NNN	0.004	0.013	0.028	0.049	0.075
Nonyl Methacrylate Monomer	NNI	0.004	0.013	0.028	0.049	0.075

BARGE: C9706: CONOCO, INC.; E344

TABLE V: SUMMARY OF PRESSURE DROP FROM MOST REMOTE CARGO TANK TO VAPOR SHORE CONNECTION

		20.0%	40.0%	60.0%	80.0%	100.0
		MAX	MAX	MAX	MAX	MAX
C	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
R	TRANSF	TRANSF	TRANSF	TRANSF	TRANSF	TRANSF
I	RATE	RATE	RATE	RATE	RATE	RATE
S	(MLTR)	(MLTR)	(MLTR)	(MLTR)	(MLTR)	(MLTR)
		1,000	2,000	3,000	4,000	5,000
		(BBL/ HR)	(BBL/ HR)	(BBL/ HR)	(BBL/ HR)	(BBL/ HR)

Nonyl Phenol	NNP	0.003	0.013	0.028	0.048	0.074
Nonyl Phenol Poly(4-12)ethoxylates	NPE					
Nonyl Phenol Sulfide (90% or less)						
Noxious liquid, N.O.S. (17) ("Trade name," contains "principal components"), Category						
Non-Noxious liquid, N.O.S. (18) ("Trade name," contains principal components"), Appen						
Octadecene						
Octadecenoamide solution (Oleamide)	ODD					
Octane (all isomers)	OAX	0.004	0.015	0.032	0.056	0.086
OCTANE	OAN	0.004	0.015	0.032	0.056	0.086
Octanoic acid (all isomers)	OAA	0.003	0.013	0.028	0.048	0.074
Octanol (all isomers)	OCK	0.003	0.013	0.028	0.048	0.074
OCTANOL	OTA	0.003	0.013	0.028	0.048	0.074
Octene (all isomers)	OTX	0.004	0.015	0.033	0.057	0.088
OCTENE (1-)	OTE	0.004	0.015	0.033	0.058	0.089
Octyl Acetate						
Octyl alcohol (iso-, n-) (all isomers), SEE OCTANOL (ALL ISOMERS)	OCK	0.003	0.013	0.028	0.048	0.074
OCTYL ALCOHOL	IOA	0.003	0.013	0.028	0.048	0.074
Octyl Aldehydes	OAL					
Octyl Decyl Adipate	ODA					
Octyl Epoxytallate	OET					
Octyl Phthalate. SEE DI-(2-ETHYLHEXYL) PHTHALATE						
OIL, EDIBLE: Babassu	OBH					
OIL, EDIBLE: Beechnut						
OIL, EDIBLE: Castor	OCA					
OIL, EDIBLE: Cocoa butter						
OIL, EDIBLE: Coconut	CCC					
OIL, EDIBLE: Cod liver						
OIL, EDIBLE: Corn	OCO					
OIL, EDIBLE: Cottonseed	OCS					
OIL, EDIBLE: Fish, N.O.S.	OFS					
OIL, EDIBLE: Grapeseed						
OIL, EDIBLE: Groundnut						
OIL, EDIBLE: Hazelnut						
OIL, EDIBLE: Lard	OLD					
OIL, EDIBLE: Maize						
OIL, EDIBLE: Mustard seed						
OIL, EDIBLE: Nutmeg Butter						
OIL, EDIBLE: Olive	OOL					
OIL, EDIBLE: Palm	OPM					
OIL, EDIBLE: Palm kernel	OPO					
OIL, EDIBLE: Peanut	OPN					
OIL, EDIBLE: Poppy						
OIL, EDIBLE: Raisin seed						
OIL, EDIBLE: Rice bran	ORP					
OIL, EDIBLE: Safflower	OSF					
OIL, EDIBLE: Salad						
OIL, EDIBLE: Sesame						
OIL, EDIBLE: Soya bean	OSB					
OIL, EDIBLE: Sunflower, SEE SUNFLOWER SEED						
OIL, EDIBLE: Sunflower seed	OSN					
OIL, EDIBLE: Tucum	OTC					
OIL, EDIBLE: Vegetable, N.O.S.	OVG					
OIL, EDIBLE: Walnut						
OIL, FUEL: No. 1 (Kerosene)	OON					
OIL, FUEL: No. 1-D	OOD					
OIL, FUEL: No. 2	OTW	0.004	0.016	0.035	0.060	0.093
OIL, FUEL: No. 2-D	OTD					
OIL, FUEL: No. 4	OFR	0.004	0.013	0.028	0.049	0.075
OIL, FUEL: No. 5	OFV	0.004	0.013	0.028	0.049	0.075
OIL, FUEL: No. 6	OSX	0.004	0.013	0.028	0.049	0.075
OIL, MISC: Absorption	OAS					
OIL, MISC: Aliphatic						

TABLE V: SUMMARY OF PRESSURE DROP FROM MOST REMOTE CARGO TANK TO VAPOR SHORE CONNECTION

	20.0%	40.0%	60.0%	80.0%	100.0
	MAX	MAX	MAX	MAX	MAX
C	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
H	TRANSF	TRANSF	TRANSF	TRANSF	TRANSF
R	RATE	RATE	RATE	RATE	RATE
I	(MLTR)	(MLTR)	(MLTR)	(MLTR)	(MLTR)
S					
	1,000	2,000	3,000	4,000	5,000
	(BBL/ HR)	(BBL/ HR)	(BBL/ HR)	(BBL/ HR)	(BBL/ HR)

	***	HK)	HK)	HK)	HK)
OIL, MISC: Animal, N.O.S.					
OIL, MISC: Aromatic					
OIL, MISC: Aviation F2300					
OIL, MISC: Clarified					
OIL, MISC: Coal	OCF				
OIL, MISC: Coconut oil, esterified, SEE COCONUT OIL, FATTY ACID METHYL ESTER					
OIL, MISC: Coconut oil, fatty acid					
OIL, MISC: Coconut oil, fatty acid Methyl Ester	OCM				
OIL, MISC: Coconut oil, Methyl Ester, SEE COCONUT OIL FATTY ACID METHYL ESTER					
OIL, MISC: Cottonseed, fatty acid, SEE COTTONSEED OIL, FATTY ACID	CFY				
OIL, MISC: Croton					
OIL, MISC: Crude					
OIL, MISC: Diesel	OIL	0.004	0.013	0.028	0.049
OIL, MISC: Gas, low pour	ODS	0.004	0.014	0.031	0.054
OIL, MISC: Gas, low sulfur					0.083
OIL, MISC: Heartcut distillate					
OIL, MISC: Lanolin					
OIL, MISC: Linseed					
OIL, MISC: Lubricating					
OIL, MISC: Mineral	OLB	0.003	0.013	0.028	0.048
OIL, MISC: Mineral seal					0.074
OIL, MISC: Motor	OMS				
OIL, MISC: Neatsfoot	OMT				
OIL, MISC: Oiticica	ONF				
OIL, MISC: Palm oil, fatty acid Methyl Ester	OOI				
OIL, MISC: Palm oil, Methyl Ester, SEE SEE PALM OIL, FATTY ACID METHYL ESTER	OPE				
OIL, MISC: Penetrating	OPE				
OIL, MISC: Perilla	OPT				
OIL, MISC: Pilchard					
OIL, MISC: Pine					
OIL, MISC: Range	OPI				
OIL, MISC: Residual	ORG				
OIL, MISC: Resin					
OIL, MISC: Resinous petroleum	ORS	0.003	0.013	0.028	0.048
OIL, MISC: Road					0.074
OIL, MISC: Rosin	ORD				
OIL, MISC: Seal	ORN				
OIL, MISC: Soapstock					
OIL, MISC: Soya bean (epoxidized)	OIS				
OIL, MISC: Sperm					
OIL, MISC: Spindle	OSP				
OIL, MISC: Spray	OSD				
OIL, MISC: Tall	OSY				
OIL, MISC: Tall, fatty acid	OTL				
OIL, MISC: Tanner's	TOF				
OIL, MISC: Transformer	OTN				
OIL, MISC: Tung	OTF				
OIL, MISC: Turbine	OTG				
OIL, MISC: Whale	OTB	0.004	0.014	0.030	0.052
OIL, MISC: White (mineral)					0.080
OIL, MISC: Wood					
alpha-Olefins (C13 - C18)					
Olefins (C13 and above, all isomers)	OAM				
Oleic acid	OLA				
Oleyl alcohol (OCTADECENOL), SEE ALCOHOLS (C13 AND ABOVE)					
Organic Amine 70, SEE AMINOETHYLDIETHANOLAMINE, AMINOETHYL-ETHANOLAMINE SOLUTION					
Palm Stearin	PMS				
n-Paraffins (C10 - C20)	PFN				
Pentadecanol, SEE SEE ALCOHOLS (C13 AND ABOVE)	PDC	0.003	0.013	0.028	0.048
Pentaethylene Glycol					0.074
Pentaethylenhexamine	PEP				
Pentane (all isomers)	PTY	0.018	0.068	0.150	0.262
					0.405

BARGE: C9706: CONOCO, INC.; E344

(SEE "TABLE IV" FOR APPLICABLE CONDITIONS)

TABLE V: SUMMARY OF PRESSURE DROP FROM MOST REMOTE CARGO TANK TO VAPOR SHORE CONNECTION

C H R I S		20.0%	40.0%	60.0%	80.0%	100.0
		MAX	MAX	MAX	MAX	MAX
		LIQUID TRANSF RATE (MLTR)	LIQUID TRANSF RATE (MLTR)	LIQUID TRANSF RATE (MLTR)	LIQUID TRANSF RATE (MLTR)	LIQUID TRANSF RATE (MLTR)
		1,000 (BBL/ HR)	2,000 (BBL/ HR)	3,000 (BBL/ HR)	4,000 (BBL/ HR)	5,000 (BBL/ HR)

	IPT	0.025	0.094	0.206	0.362	0.561
	PTA	0.017	0.066	0.146	0.256	0.396
	PTX	0.021	0.081	0.179	0.313	0.485
	PTE	0.021	0.081	0.179	0.313	0.485
	PTL					
	PXE					
	PIN	0.004	0.014	0.030	0.052	0.080
	PPX					
	PAO					
	PLB	0.004	0.013	0.029	0.050	0.077
	PSM					
	PLP					
	PGC	0.003	0.013	0.028	0.048	0.074
	PGM	0.004	0.014	0.031	0.054	0.083
	POE					
	PRP					
	PKP					
	IAC	0.005	0.017	0.037	0.065	0.100
	PAT	0.005	0.017	0.038	0.065	0.100
	IPA	0.005	0.017	0.037	0.064	0.098
	PAL	0.004	0.014	0.031	0.054	0.083
	PBZ	0.004	0.013	0.029	0.050	0.077
	IPX	0.003	0.013	0.028	0.048	0.074
	PPL					
	PBP					
	PDR					
	PPG	0.003	0.013	0.028	0.048	0.074
	PGE					
	PGY					
	PME	0.004	0.014	0.031	0.053	0.082
	PTT	0.003	0.013	0.028	0.048	0.073
	PTR					
	SAN					
	SBN					
	SRA					
	SPL	0.003	0.013	0.028	0.048	0.074
	TLO					
	TFD					
	TTN					
	TTD	0.003	0.013	0.028	0.048	0.074

BARGE: C9706; CONOCO, INC.; E344

(SEE "TABLE IV" FOR APPLICABLE CONDITIONS)

TABLE V: SUMMARY OF PRESSURE DROP FROM MOST REMOTE CARGO TANK TO VAPOR SHORE CONNECTION

C H R I S		20.0%	40.0%	60.0%	80.0%	100.0
		MAX	MAX	MAX	MAX	MAX
		LIQUID TRANSF RATE (MLTR)	LIQUID TRANSF RATE (MLTR)	LIQUID TRANSF RATE (MLTR)	LIQUID TRANSF RATE (MLTR)	LIQUID TRANSF RATE (MLTR)
		1,000 (BBL/ HR)	2,000 (BBL/ HR)	3,000 (BBL/ HR)	4,000 (BBL/ HR)	5,000 (BBL/ HR)

	TBD					
	TTG	0.003	0.013	0.028	0.048	0.074
	THN	0.004	0.013	0.028	0.048	0.074
	TOL	0.004	0.016	0.035	0.060	0.093
	TBP					
	TCP	0.003	0.013	0.028	0.048	0.074
	TRD	0.003	0.013	0.028	0.048	0.074
	TDN	0.003	0.013	0.028	0.048	0.074
	TDC	0.003	0.013	0.028	0.048	0.074
	TRB					
	TEB	0.003	0.013	0.028	0.048	0.074
	TEG	0.003	0.013	0.028	0.048	0.074
	TGD					
	TGE					
	TPS	0.003	0.013	0.028	0.048	0.074
	TIP					
	TRE	0.004	0.013	0.028	0.049	0.076
	TMB	0.004	0.013	0.028	0.049	0.076
	TMD	0.004	0.013	0.028	0.049	0.076
	TME	0.004	0.013	0.028	0.049	0.076
	TFR					
	TMP					
	TGC					
	TGM					
	TRP					
	TPT					
	UDC	0.004	0.013	0.028	0.049	0.074
	UND	0.003	0.013	0.028	0.048	0.074
	UDB					
	WAX					
	WAX,					
	WAX,					
	WSL					
	XLX	0.004	0.014	0.030	0.053	0.081
	XLM	0.004	0.014	0.030	0.053	0.081
	XLO	0.004	0.014	0.030	0.052	0.079
	XLP	0.004	0.014	0.030	0.053	0.081
	XYL	0.004	0.013	0.028	0.049	0.075

BARGE: C9706: CONOCO, INC.; E344

(SEE "TABLE IV" FOR APPLICABLE CONDITIONS)

TABLE V: SUMMARY OF PRESSURE DROP FROM MOST REMOTE CARGO TANK TO VAPOR SHORE CONNECTION

	20.0%	40.0%	60.0%	80.0%	100.0%
	MAX	MAX	MAX	MAX	MAX
C	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
H	TRANSF	TRANSF	TRANSF	TRANSF	TRANSF
R	RATE	RATE	RATE	RATE	RATE
I	(MLTR)	(MLTR)	(MLTR)	(MLTR)	(MLTR)
S					
	1,000	2,000	3,000	4,000	5,000
	(BBL/	(BBL/	(BBL/	(BBL/	(BBL/
	HR)	HR)	HR)	HR)	HR)

CARGO

46 CFR SUBCHAPTER D, BUT NOT TABLE 30.25-1

AROMATIC RESIN OIL 60
 AROMATIC RESIN OIL 80
 AROMATIC RESIN OILS

ARS	0.003	0.013	0.028	0.048	0.074
ARS	0.003	0.013	0.028	0.048	0.074

CALCULATIONS FOR CAPACITY OF SPILL VALVE
 BARGE: C9706: CONOCO, INC.; E344

MAX DESIGN WORKING PRESS (MDWP) 3.000 PSIG
 SPILL VALVE SET PRESSURE (Ps/v) 1.750 PSIG
 CARGO TANK P/V SETTING (Pp/v) 1.500 PSIG
 "TARGET" MAX LIQUID TRANSFER RATE (TMLTR) 5,000 BPH
 SPILL VALVE CAPACITY (WATER) @ MAX DESIGN WORKING PRESSURE (Qw) max 6,750 BPH

CARGO	C H R I S	LIQUID SPECIFIC GRAVITY (1)	CARGO MAX LIQUID TRANSFER RATE (Q1) (BPH)	EQUIVALENT WATER LIQUID TRANSFER RATE Qw = (Q1) * SG1 ^{1.5} (BPH)	Qw <= (Qw) max
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46 CFR SUBCHAPT O, TABLE 151

ACETIC ACID	AAC	1.05	5,000	5,123	OK
ACETIC ANHYDRIDE	ACA	1.08	5,000	5,203	OK
ACETONITRILE	ATN	0.78	5,000	4,416	OK
ACRYLIC ACID	ACR	1.05	5,000	5,123	OK
ACRYLONITRILE	ACN	0.81	5,000	4,500	OK
ADIPONITRILE	ADN	0.95	5,000	4,873	OK
ALUMINUM SULFATE SOLUTION	ASX	1.76	5,000	6,633	OK
AMINOETHYLETHANOLAMINE	AEE	1.03	5,000	5,070	OK
AMMONIUM BISULFITE SOLN (70% OR LESS)	ABX	1.44	5,000	6,000	OK
AMMONIUM HYDROXIDE (28% OR LESS NH3)	AMH				
ANTHRACENE OIL (COAL TAR FRACTION)	AHO				
BENZENE	BNZ	0.88	5,000	4,688	OK
BENZENE HYDROCARBON MIXTURES (W/ACETYLENES) (W/10% BENZENE OR MORE)	BHA	0.84	5,000	4,583	OK
BENZENE HYDROCARBON MIXTURES (W/10% BENZENE OR MORE)	BHB	0.84	5,000	4,583	OK
BENZENE, TOLUENE, XYLENE MIXTURES (HAVING 10% BENZENE OR MORE)	BTX	0.84	5,000	4,583	OK
iso-BUTYL ACRYLATE	BAI	0.88	5,000	4,690	OK
n-BUTYL ACRYLATE	BTC	0.90	5,000	4,741	OK
BUTYL ACRYLATE (SEE ISO- & N- BUTYL ACRYLATE)	BAR	0.90	5,000	4,743	OK
BUTYL METHACRYLATE	BMH	0.88	5,000	4,690	OK
iso-BUTYRALDEHYDE	BAD	0.80	5,000	4,481	OK
n-BUTYRALDEHYDE	BTR	0.80	5,000	4,472	OK
BUTYRALDEHYDES (CRUDE)	BFA	0.82	5,000	4,528	OK
BUTYRALDEHYDE (ISO-, N-)	BAE	0.82	5,000	4,528	OK
CAMPOR OIL (LIGHT)	CPO	0.92	5,000	4,804	OK
CARBON TETRACHLORIDE	CBT	1.59	5,000	6,305	OK
CAUSTIC POTASH SOLUTION	CPS	1.50	5,000	6,124	OK
CAUSTIC SODA SOLUTION	CSS	1.50	5,000	6,124	OK
CHLOROBENZENE	CRB	1.11	5,000	5,268	OK
CHLOROFORM	GRF	1.48	5,000	6,083	OK
CHLOROSULFONIC ACID	CSA	1.79	5,000	6,690	OK
COAL TAR NAPHTHA SOLVENT	NCT	0.88	5,000	4,690	OK
CREOSOTE (COAL TAR)	CCT	1.07	5,000	5,172	OK
CREOSOTE (WOOD)	CWD	1.07	5,000	5,172	OK
CRESOLS (ALL ISOMERS)	CRS	1.05	5,000	5,123	OK
CRESOLS WITH LESS THAN 5% PHENOL (SEE CRESOLS (ALL ISOMERS))	CRS	1.05	5,000	5,123	OK
CRESOLS WITH 5% OR MORE PHENOL (SEE PHENOL)	CFP	1.07	5,000	5,172	OK
CRESYLATE SPENT CAUSTIC	CSC	1.55	5,000	6,225	OK
CRESYLIC ACID, SODIUM SALT SOLUTION, SEE CRESYLATE SPENT CAUSTIC	CAX (TAR ?)				
CROTONALDEHYDE	CTA	0.85	5,000	4,610	OK
CYCLOHEXANONE	CCH	0.95	5,000	4,873	OK
CYCLOHEXYLAMINE	CHA	0.87	5,000	4,664	OK
DECYL ACRYLATE (iso-, n-)	DAT	0.89	5,000	4,717	OK
DICHLOROETHANE (ALL ISOMERS)	DBX	1.30	5,000	5,701	OK
1,1-DICHLOROETHANE	DCH	1.18	5,000	5,431	OK
2,2-DICHLOROETHYL ETHER	DEE	1.22	5,000	5,523	OK
DICHLOROMETHANE (ALSO KNOWN AS METHYLENE CHLORIDE)	DCM	1.32	5,000	5,745	OK
2,4-DICHLOROPHENOXYACETIC ACID DIETHANOLAMINE SALT SOLUTION	DDE				
2,4-DICHLOROPHENOXYACETIC ACID, DIMETHYLAMINE SALT SOLUTION	DAD				
2,4-DICHLOROPHENOXYACETIC ACID, TRIISOPROPANOLAMINE SALT SOLUTION	DTI				
1,1-,1,2- OR 1,3- DICHLOROPROPANE	DPX	1.16	5,000	5,385	OK
1,3-DICHLOROPROPENE	DFU	1.23	5,000	5,545	OK
DICHLOROPROPENE, DICHLOROPROPANE MIXTURES	DMX	1.21	5,000	5,500	OK

CALCULATIONS FOR CAPACITY OF SPILL VALVE
BARGE: C9706: CONOCO, INC.; E344

MAX DESIGN WORKING PRESS
SPILL VALVE SET PRESSURE
CARGO TANK P/V SETTING
"TARGET" MAX LIQUID TRANSFER RATE
SPILL VALVE CAPACITY (WATER) @ MAX DESIGN WORKING PRESSURE

(MDWP) 3.000 PSIG
(Ps/v) 1.750 PSIG
(Pp/v) 1.500 PSIG
(TMLTR) 5,000 BPH
(Qw) max 6,750 BPH

C H R I S	LIQUID SPECIFIC GRAVITY (1)	CARGO MAX LIQUID TRANSFER RATE (Q1) (BPH)	EQUIVALENT WATER LIQUID TRANSFER RATE $Q_w = (Q1) \cdot SG1^{.5}$ (BPH)	$Q_w \leq (Q_w)_{max}$
*** *****				
2,2-DICHLOROPROPIONIC ACID	DCN			
DIETHANOLAMINE	DEA	1.09	5,000	5,220 OK
DIETHYLAMINE	DEN	0.71	5,000	4,213 OK
DIETHYLENETRIAMINE	DET	0.96	5,000	4,899 OK
DIETHYL ETHER, SEE ETHYL ETHER	DEH			
DIISOBUTYLAMINE	DBU	0.75	5,000	4,330 OK
DIISOPROPANOLAMINE	DIP	0.98	5,000	4,950 OK
DIISOPROPYLAMINE	DIA	0.72	5,000	4,243 OK
N,N-DIMETHYLACETAMIDE	DAC	0.95	5,000	4,873 OK
DIMETHYLETHANOLAMINE	DMB	0.89	5,000	4,717 OK
DIMETHYLFORMAMIDE	DMF	0.95	5,000	4,873 OK
1,4-DIOXANE	DOX	1.04	5,000	5,099 OK
DI-N-PROPYLAMINE	DNA	0.74	5,000	4,301 OK
ETHANOLAMINE	MEA	1.02	5,000	5,050 OK
ETHYL ACRYLATE	EAC	0.93	5,000	4,822 OK
ETHYLAMINE SOLUTION (72% OR LESS)	EAN	0.80	5,000	4,472 OK
N-ETHYLBUTYLAMINE	EBA	0.74	5,000	4,301 OK
N-ETHYLCYCLOHEXYLAMINE	ECC	0.86	5,000	4,637 OK
ETHYLENE CYANOHYDRIN	ETC	1.04	5,000	5,099 OK
ETHYLENEDIAMINE	EDA	0.91	5,000	4,770 OK
ETHYLENE DIBROMIDE	EDB	2.17	4,582	6,750 OK
ETHYLENE DICHLORIDE	EDC	1.26	5,000	5,612 OK
ETHYLENE GLYCOL PROPYL ETHER	EGP	0.91	5,000	4,770 OK
2-ETHYLHEXYL ACRYLATE	EAI	0.89	5,000	4,717 OK
ETHYLIDENE NORBORNENE	ENB	0.90	5,000	4,743 OK
ETHYL METHACRYLATE	ETM	0.92	5,000	4,796 OK
2-ETHYL-3-PROPYLACROLEIN	EPA	0.85	5,000	4,610 OK
FERRIC CHLORIDE SOLUTIONS	FCS			
FORMALDEHYDE SOLUTION (37% TO 50%)	FMS	1.13	5,000	5,315 OK
FORMIC ACID	FMA	1.22	5,000	5,523 OK
FURFURAL	FFA	1.20	5,000	5,477 OK
GLUTARALDEHYDE SOLUTION (50% OR LESS)	GTA			
HEXAMETHYLENEDIAMINE SOLUTION	HMC	0.93	5,000	4,822 OK
HEXAMETHYLENEIMINE	HMI	0.88	5,000	4,690 OK
HYDROCHLORIC ACID SPENT (15% OR LESS)	HCS	1.21	5,000	5,500 OK
ISOPENTALDEHYDE (MIXED ISOMERS) (SEE VALERALDEHYDE (ISO-, N-))				
ISOPRENE	IPR	0.69	5,000	4,153 OK
KRAFT PULPING LIQUORS (FREE ALKALI CONTENT 3% OR MORE) (INCLUDING: BLACK, GREY, KPL)	MSO	0.86	5,000	4,637 OK
MESITYL OXIDE	MAM	0.95	5,000	4,873 OK
METHYL ACRYLATE	MCK	0.94	5,000	4,848 OK
METHYLCYCLOPENTADIENE DIMER	MDE	1.04	5,000	5,099 OK
METHYL DIETHANOLAMINE	MEP	0.92	5,000	4,796 OK
2-METHYL-5-ETHYLPYRIDINE	MMM	0.94	5,000	4,848 OK
METHYLENE CHLORIDE (SEE DICHLOROMETHANE)	MFR	0.95	5,000	4,873 OK
METHYL METHACRYLATE	MSR	0.89	5,000	4,717 OK
2-METHYLPYRIDINE	MPL	1.00	5,000	5,000 OK
alpha-METHYLSTYRENE	NCD			
MORPHOLINE	NPM	0.99	5,000	4,975 OK
NITRIC ACID (70% OR LESS)	ONE	1.00	5,000	5,000 OK
NITROPROPANE (-1, OR -2)	OLM	1.98	4,797	6,750 OK
OCTYL NITRATES (ALL ISOMERS)	PCE	1.67	5,000	6,461 OK
OLEUM	PDE	0.68	5,000	4,123 OK
PENTACHLOROETHANE	PER	1.62	5,000	6,364 OK
1, 3-PENTADIENE				
PERCHLOROETHYLENE (SAME AS TETRACHLOROETHYLENE)				

CALCULATIONS FOR CAPACITY OF SPILL VALVE
BARGE: C9706; CONOCO, INC.; E344

MAX DESIGN WORKING PRESS

SPILL VALVE SET PRESSURE

CARGO TANK P/V SETTING

"TARGET" MAX LIQUID TRANSFER RATE

SPILL VALVE CAPACITY (WATER) @ MAX DESIGN WORKING PRESSURE

(MDWP) 3.000 PSIG
(Pa/v) 1.750 PSIG
(Pp/v) 1.500 PSIG
(TMLTR) 5,000 BPH
(Qw)max 6,750 BPH

CARGO	C H R I S	LIQUID SPECIFIC GRAVITY (1)	CARGO MAX LIQUID TRANSFER RATE (Q1) (BPH)	EQUIVALENT WATER LIQUID TRANSFER RATE $Q_w = (Q1) \cdot SG1^{.5}$ (BPH)	$Q_w \leq (Q_w)_{max}$
PHOSPHORIC ACID	PAC	1.83	4,990	6,750	OK
POLYETHYLENE POLYAMINES	PEB	0.99	5,000	4,975	OK
POLYMETHYLENE POLYPHENYL ISOCYANATE	PPI	1.20	5,000	5,477	OK
POTASSIUM HYDROXIDE SOLUTION (SEE CAUSTIC POTASH SOLUTION)					
iso-PROPANOLAMINE	MPA	0.96	5,000	4,899	OK
PROPANOLAMINE (iso-, n-)	PAX	0.96	5,000	4,899	OK
PROPIONIC ACID	PNA	1.00	5,000	5,000	OK
iso-PROPYLAMINE	IPP	0.69	5,000	4,153	OK
iso-PROPYL ETHER	IPE	0.72	5,000	4,243	OK
PYRIDINE	PRD	0.98	5,000	4,950	OK
SODIUM ALUMINATE SOLUTION	SAU				
SODIUM CHLORATE SOLUTION (50% OR LESS)	SDD	1.63	5,000	6,384	OK
SODIUM DICHROMATE SOL'N (70% OR LESS)	SDL				
SODIUM HYDROXIDE SOLUTION (SEE CAUSTIC SODA SOLUTION)					
SODIUM HYPOCHLORITE SOL'N (15% OR LESS)	SHP	1.10	5,000	5,244	OK
SODIUM SULFIDE, HYDROSULFIDE SOLUTIONS (H2S 15 PPM OR LESS)	SSH	1.32	5,000	5,745	OK
SODIUM SULFIDE HYDROSULFIDE SOLUTIONS (15 PPM<H2S<200 PPM)	SSI	1.32	5,000	5,745	OK
SODIUM SULFIDE HYDROSULFIDE SOLUTIONS (H2S GREATER THAN 200 PPM)	SSJ	1.32	5,000	5,745	OK
SODIUM THIOCYANATE SOLUTION (56% OR LESS)	STS				
STYRENE MONOMER	STY	0.92	5,000	4,796	OK
SULFURIC ACID	SFA	1.84	4,976	6,750	OK
SULFURIC ACID, SPENT	SAC	1.39	5,000	5,895	OK
1,1,2,2-TETRACHLOROETHANE (ACETYLENE TETRACHLORIDE)	TEC	1.59	5,000	6,311	OK
TETRAETHYLENEPENTAMINE	TTP	1.00	5,000	5,000	OK
TETRAHYDROFURAN	THF	0.89	5,000	4,717	OK
1,1,2-TRICHLOROETHANE (VINYL TRICHLORIDE)	TCM	1.44	5,000	6,000	OK
TRICHLOROETHANE (SEE 1,1,2-TRICHLOROETHANE)					
TRICHLOROETHYLENE	TCL	1.46	5,000	6,042	OK
1,2,3-TRICHLOROPROPANE	TCN	1.39	5,000	5,895	OK
TRIETHANOLAMINE	TEA	1.13	5,000	5,315	OK
TRIETHYLAMINE	TEN	0.73	5,000	4,272	OK
TRIETHYLENETETRAMINE	TET	0.98	5,000	4,950	OK
UREA, AMMONIUM NITRATE SOL'N (CONTAINING MORE THAN 2% NH3)	UAS				
VALERALDEHYDE (iso-, n-)		0.79	5,000	4,444	OK
VALERALDEHYDE (iso-)	IVA	0.79	5,000	4,444	OK
VALERALDEHYDE (n-)	VAL	0.84	5,000	4,583	OK
VANILLAN BLACK LIQUOR (FREE ALKALI CONTENT 3% OR MORE)	VLB				
VINYL ACETATE	VAM	0.94	5,000	4,848	OK
VINYLTOLUENE	VNT	0.90	5,000	4,743	OK

CALCULATIONS FOR CAPACITY OF SPILL VALVE
 BARGE: C9706: CONOCO, INC.; E344

MAX DESIGN WORKING PRESS
 SPILL VALVE SET PRESSURE
 CARGO TANK P/V SETTING
 "TARGET" MAX LIQUID TRANSFER RATE
 SPILL VALVE CAPACITY (WATER) @ MAX DESIGN WORKING PRESSURE

(MDWP) 3.000 PSIG
 (Ps/v) 1.750 PSIG
 (Pp/v) 1.500 PSIG
 (TMLTR) 5,000 BPH
 (Qw)max 6,750 BPH

CARGO

C H R I S	LIQUID SPECIFIC GRAVITY (1)	CARGO MAX LIQUID TRANSFER RATE (Q1) (BPH)	EQUIVALENT WATER LIQUID TRANSFER RATE Qw = (Q1) * SG1 ^{1.5} (BPH)	Qw <= (Qw) max
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46 CFR SUBCHAPT O BUT NOT TABLE 151

1,1-DICHLOROPROPANE	DPB	1.16	5,000	5,385	OK
1,1,1-TRICHLOROETHANE		1.51	5,000	6,144	OK
1,2-DICHLOROPROPANE	DPP	1.16	5,000	5,385	OK
1,3 CYCLOPENTADIENE					
1,3-DICHLOROPROPANE	DPC	1.16	5,000	5,385	OK
2-METHYL-2-HYDROXY-3-BUTYNE	MHB	0.86	5,000	4,637	OK
2,4-DICHLOROPHENOXYACETIC ACID, DIMETHYLAMINE SALT SOLUTION (70% OR LESS)	DDA				
3-PENTENENITRILE	PNT (CRUDE ?)				
AEROTHENE TT (1,1,1-TRICHLOROETHANE)					
ALKYLBENZENE					
AMINOETHYLPIPERAZINE	AEP				
BENZENE RAFFINATE (ASSUME VAPOR PROPERTIES SIMILAR TO BENZENE)					
BENZENE SULFONYL CHLORIDE	BSC	0.70	5,000	4,183	OK
BENZYL ACETATE	BZE	1.38	5,000	5,874	OK
BENZYL CHLORIDE (STABILIZED)	BCL	1.04	5,000	5,099	OK
BUTANOL		1.10	5,000	5,244	OK
BUTYL ETHER (n-)	BTE	0.77	5,000	4,387	OK
BUTYLENE OXIDE (1,2-)	BTO	0.83	5,000	4,555	OK
BUTYRIC ACID	BRA	0.96	5,000	4,899	OK
CARBOLIC ACID	CBO	1.04	5,000	5,099	OK
CHLOROACETIC ACID (80% OR LESS)	CHM	1.58	5,000	6,285	OK
CHLOROPROPIONIC ACID (2- OR 3-)	CFM	1.26	5,000	5,612	OK
CHLOROTOLUENE (m-)	CTM	1.07	5,000	5,172	OK
CHLOROTOLUENE (o-)	CTO	1.08	5,000	5,196	OK
CHLOROTOLUENE (p)	CRW	1.07	5,000	5,172	OK
CHLOROTOLUENES (MIXED ISOMERS)	CHI	1.08	5,000	5,196	OK
CREOSOTE (ALL ISOMERS)	CCW	1.07	5,000	5,172	OK
CRESYLIC ACID TAR	CRX	1.05	5,000	5,123	OK
CYCLOHEPTANE	CYE	0.81	5,000	4,500	OK
CYCLOHEXANONE, CYCLOHEXANOL MIXTURE	CYX	0.95	5,000	4,873	OK
CYCLOHEXYL ACETATE	CYC	0.97	5,000	4,924	OK
CYCLOPENTADIENE, STYRENE, BENZENE MIXTURE	CSB	1.50	5,000	6,124	OK
CYCLOPENTANE	CYP	0.74	5,000	4,301	OK
DECANOIC ACID	DCO	0.94	2,770	6,750	OK
DI 2 ETHYLHEXYL PHTHALATE (SEE ALSO ETHYLHEXYL PHTHALATE)		0.98	5,000	4,955	OK
DICHLOROISOPROPYL ETHER (2,2'-)	DCI	1.11	5,000	5,268	OK
DICHLOROPROPANE		1.16	5,000	5,385	OK
DICHLOROPROPENE		1.23	5,000	5,545	OK
DIETHYL SULFATE	DSU	1.18	5,000	5,431	OK
DIETHYLETHANOLAMINE	DAE	0.89	5,000	4,717	OK
DODECYL BENZENE					
DODECYLDIMETHYLAMINE TETRADECYLDIMETHYLAMINE MIXTURE	DOT				
DRIPOLENE					
ETHANOL (see ethyl alcohol)					
ETHYL BROMIDE					
ETHYL TERT-BUTYL ETHER					
ETHYLAMINE	EBE	0.73	5,000	4,272	OK
ETHYLENE DICHLORIDE 1,1,2-TRICHLOROETHANE MIXTURE	EAM	0.80	5,000	4,472	OK
ETHYLMERCAPTAN (SAME AS ETHANETHIOL)	ETX	1.44	5,000	6,000	OK
ETHYLPHENOL					
FORMALDEHYDE SOLUTION (50% OR MORE), METHANOL MIXTURES	EPL	1.04	5,000	5,099	OK
HYDROSULFIDE	MTM	0.79	5,000	4,444	OK

CALCULATIONS FOR CAPACITY OF SPILL VALVE
 BARGE: C9706: CONOCO, INC.; E344

MAX DESIGN WORKING PRESS
 SPILL VALVE SET PRESSURE
 CARGO TANK P/V SETTING
 "TARGET" MAX LIQUID TRANSFER RATE
 SPILL VALVE CAPACITY (WATER) @ MAX DESIGN WORKING PRESSURE

(MDWP) 3.000 PSIG
 (Ps/v) 1.750 PSIG
 (Pp/v) 1.500 PSIG
 (TMLTR) 5,000 BPH
 (Qw) max 6,750 BPH

CARGO	C H R I S	LIQUID SPECIFIC GRAVITY (1)	CARGO MAX LIQUID TRANSFER RATE (Q1) (BPH)	EQUIVALENT WATER LIQUID TRANSFER RATE $Q_w = (Q_1) \cdot SG_1^{.5}$ (BPH)	Qw <= (Qw) max
*** *****					
INDENES					
ISOBUTYL ACETATE	IBA				
ISOPRENE, PENTADIENE MIXTURE	IPN				
ISO-PROPYL ALCOHOL		0.79	5,000	4,444	OK
LAURIC ACID	LRA	0.88	5,000	4,690	OK
METHACRYLONITRILE	MET	0.80	5,000	4,472	OK
METHANOL		0.79	5,000	4,447	OK
METHYL STYRENE					
METHYL STYRENE, INDENES, ALKYL BENZENE MIXTURES					
METHYLCYCLOHEXANE	MIA				
METHYLHEXANE (SAME AS HEPTANE)	MCY	0.77	5,000	4,387	OK
MONOETHANOLAMINE					
MONOISOPROPANOLAMINE	MEA	1.02	5,000	5,050	OK
NAPHTHALENE (MOLTEN)		0.96	5,000	4,899	OK
NBODECANOIC ACID	NTM	1.15	5,000	5,362	OK
NITRILOTRIACETIC ACID	NEA	0.92	5,000	4,796	OK
NITROPHENOL (MOLTEN)	NAA (&SALTS ?)				
NITROPROPANE (60%), NITROETHANE (40%) MIXTURE	NTP	1.49	5,000	6,103	OK
NITROTOLUENE (o-,p-)	NNM	1.05	5,000	5,123	OK
PARALDEHYDE	NIT	1.16	5,000	5,385	OK
POLYGLYCERINE, SODIUM SALT SOLN (CONTAINING 3% OR MORE SODIUM HYDROXIE)	PDH	0.99	5,000	4,975	OK
PROPIONALDEHYDE	PGS				
PROPIONIC ANHYDRIDE	PAD	0.81	5,000	4,500	OK
PROPIONITRILE	PAH	1.01	5,000	5,025	OK
PROPYLAMINE (n-)	PCN	0.70	5,000	4,183	OK
PROPYLBENZENE	PRA	0.72	5,000	4,243	OK
PYROLYSIS GASOLINE (GREATER THAN 5% BENZENE)					
PYROLYSIS RESIDUAL FUELS	GPY	0.84	5,000	4,583	OK
SEWAGE, RAW		0.89	5,000	4,717	OK
SODIUM SULFIDE (SOLID IN WATER)	SWR				
STYRENE	SDS	1.53	5,000	6,185	OK
STYRENE CRUDE	STY	0.92	5,000	4,796	OK
STYRENE TAR	STX	0.92	5,000	4,796	OK
TETRAMETHYLBENZENE (1,2,3,5-)	STT				
TOLUIDINE (o-)	TTB	0.89	5,000	4,717	OK
TRICHLOROBENZENE (1,2,4-)	TLI	1.00	5,000	5,000	OK
TRIISOPROPANOLAMINE SALT OF 2,4-DICHLOROPHENOXO ACETIC ACID SOL'N	TCS	1.45	5,000	6,021	OK
TRIPHENYLBORANE					
UNDECANOIC ACID	TPE				
HYDROCARBON 5-9	UDA	0.89	5,000	4,717	OK
	HFN	0.85	5,000	4,610	OK

CALCULATIONS FOR CAPACITY OF SPILL VALVE
 BARGE: C9706: CONOCO, INC.; E344

MAX DESIGN WORKING PRESS (MDWP) 3.000 PSIG
 SPILL VALVE SET PRESSURE (Ps/v) 1.750 PSIG
 CARGO TANK P/V SETTING (Pp/v) 1.500 PSIG
 "TARGET" MAX LIQUID TRANSFER RATE (TMLTR) 5,000 BPH
 SPILL VALVE CAPACITY (WATER) @ MAX DESIGN WORKING PRESSURE (Qw)max 6,750 BPH

CARGO	C H R I S	LIQUID SPECIFIC GRAVITY (1)	CARGO MAX LIQUID TRANSFER RATE (Q1) (BPH)	EQUIVALENT WATER LIQUID TRANSFER RATE Qw = (Q1) * SG1 ^{1.5} (BPH)	Qw <= (Qw)max
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46 CFR SUBCHAPTER D, TABLE 30.25-1

Acetone	ACT	0.79	5,000	4,450	OK
Acetophenone	ACP	1.03	5,000	5,065	OK
Acetyl Tributyl Citrate		1.05	5,000	5,114	OK
Acrylonitrile-Styrene Copolymer dispersion in Polyether Polyol	ALE				
Alcohols (C13 and above)	ALY				
Alcoholic beverages, N.O.S.					
Alcohol (C6 - C17) (secondary) Poly(3-6)ethoxylates					
Alcohol (C12 - C15) Poly(1-3)ethoxylates					
Alcohol (C12 - C15) Poly(3-11)ethoxylates					
Alkenylsuccinic acid					
Alkenylsuccinic Anhydride					
Alkyl (C9 - C17) Benzenes	AKB				
Alkylbenzenesulfonic acid (4% or less)	ABS				
Alkyl Phthalates (n-)					
Alkyl Succinate Formaldehyde Hydr- oxyamino condensate (3.2% or less)					
Aminoethyldiethanolamine, Aminoethylethanolamine solution					
Amyl Acetate (commercial, iso-, n-, sec-)	AEC	0.87	5,000	4,664	OK
AMYL ACETATE (n-)	AML	0.88	5,000	4,690	OK
AMYL ACETATE (iso-)	IAT	0.88	5,000	4,690	OK
Amyl alcohol (iso-, n-, sec-, primary) (SEE ALSO IAA)	AAI	0.82	5,000	4,528	OK
Amyl alcohol (n-)	AAN	0.82	5,000	4,528	OK
Amyl alcohol (tert-)	AAI				
AMYL ALCOHOL, PRIMARY	APM	0.82	5,000	4,528	OK
AMYL ALCOHOL, (sec-)	ASE	0.82	5,000	4,528	OK
Amylene	AMZ				
AMYL ALCOHOL, (iso-)	IAA	0.82	5,000	4,528	OK
Amyl Methyl Ketone	AMK				
Amyl Tallate					
Asphalt	ASP	1.04	5,000	5,087	OK
ASPHALT BLENDING STOCKS: Roofers flux	ARF				
ASPHALT BLENDING STOCKS: Straight run residue	ASR				
Behenyl alcohol					
Benzene Tricarboxylic acid Trioctyl Ester					
Benzyl alcohol	BAL	1.05	5,000	5,123	OK
Bicyclic Terpenel Polyamide salt					
Brake fluid base mixtures (containing Poly(2-8)alkylene (C2-C3) glycols, PolBFX					
Butane	BMX	1.03	5,000	5,074	OK
Butene, SEE BUTYLENE					
Butene Oligomer	BOL				
Butyl Acetate (iso-, n-)	BAX	0.87	5,000	4,664	OK
BUTYL ACETATE (N-)	BCN	0.88	5,000	4,690	OK
Butyl Acetate (sec-)	BTA	0.89	5,000	4,717	OK
Butyl alcohol (iso-, n-, sec-, tert-)					
BUTYL ALCOHOL (ISO-)	IAL	0.81	5,000	4,500	OK
BUTYL ALCOHOL (N-)	BAN	0.81	5,000	4,500	OK
BUTYL ALCOHOL (SEC-)	BAS	0.81	5,000	4,500	OK
BUTYL ALCOHOL (TERT-)	BAT	0.78	5,000	4,416	OK
Butyl Benzyl Phthalate	BPH	1.12	5,000	5,292	OK
Butylene	BTN				
Butylene Glycol	BUG				
1,3-Butylene Glycol, SEE BUTYLENE GLYCOL					
Butylene Polyglycol, SEE BUTYLENE GLYCOL					

CALCULATIONS FOR CAPACITY OF SPILL VALVE
 BARGE: C9706: CONOCO, INC.; E344

MAX DESIGN WORKING PRESS (MDWP) 3.000 PSIG
 SPILL VALVE SET PRESSURE (Ps/v) 1.750 PSIG
 CARGO TANK P/V SETTING (Pp/v) 1.500 PSIG
 "TARGET" MAX LIQUID TRANSFER RATE (TMLTR) 5,000 BPH
 SPILL VALVE CAPACITY (WATER) @ MAX DESIGN WORKING PRESSURE (Qw) max 6,750 BPH

CARGO	C H R I S	LIQUID SPECIFIC GRAVITY (1)	CARGO MAX LIQUID TRANSFER RATE (Q1) (BPH)	EQUIVALENT WATER LIQUID TRANSFER RATE $Q_w = (Q_1) \cdot SG_1^{.5}$ (BPH)	$Q_w \leq (Q_w)_{max}$
*** *****					
iso-Butyl Formate					
n-Butyl Formate					
Butyl Heptyl Ketone	BHK				
Butyl Methyl Ketone, SEE METHYL BUTYL KETONE					
Butyl Stearate					
Butyl Toluene					
Butyrolactone (gamma)	BUE	0.85	5,000	4,610	OK
Calcium Alkylphenate	BLA				
Calcium Alkyl Salicylate					
Calcium Amino Nonyl Phenolate					
Calcium Carboxylate					
Caprolactam solutions					
Carbon black base	CLS	1.02	5,000	5,050	OK
Cetyl alcohol (HEXADECANOL) SEE ALCOHOLS (C13 AND ABOVE)		0.90	5,000	4,743	OK
Cetyl-Stearal alcohol					
Cleaning spirit (unleaded)					
Coal tar					
Cumene	COR	1.11	5,000	5,268	OK
Cycloaliphatic resins	CUM	0.86	5,000	4,640	OK
Cyclohexane					
Cyclohexanol	CHX	0.78	5,000	4,413	OK
1,3-Cyclopentadiene dimer (molten)	CHN	0.95	5,000	4,873	OK
Cyclopentadiene polymers, SEE 1,3-CYCLOPENTADIENE DIMER (MOLTEN)	CPD	0.69	5,000	4,153	OK
Cymene (para-)					
Decahydronaphthalene	CMP	0.86	5,000	4,637	OK
Decaldehyde (iso-)	DHN	0.89	5,000	4,717	OK
Decaldehyde (n-)	IDA	0.83	5,000	4,555	OK
Decane	DAL	0.83	5,000	4,555	OK
Decene	DDC				
Decyl alcohol (all isomers) (DECANOL)	DCE	0.74	5,000	4,301	OK
DECYL ALCOHOL (iso-)	DAX	0.83	5,000	4,555	OK
DECYL ALCOHOL (n-)	ISA	0.83	5,000	4,555	OK
Decylbenzene (n-)	DAN	0.83	5,000	4,555	OK
Detergent Alkylate	DBZ	0.86	5,000	4,637	OK
Diacetone alcohol					
Dialkyl (C10-C14) Benzenes	DAA	0.97	5,000	4,933	OK
Dialkyl (C7-C13) Phthalates	DAB				
Dibutyl Carbinol	DAH				
Dibutyl Phthalate (ortho-)					
Dicyclopentadiene, SEE 1,3-CYCLOPENTADIENE DIMER (MOLTEN)	DPA	1.05	5,000	5,123	OK
Diethylbenzene	DPT	0.98	5,000	4,950	OK
Diethylene Glycol	DEB	0.87	5,000	4,664	OK
Diethylene Glycol Butyl Ether	DEG	1.12	5,000	5,292	OK
Diethylene Glycol Butyl Ether Acetate	DME	0.95	5,000	4,873	OK
Diethylene Glycol Dibutyl Ether	DEM				
Diethylene Glycol Diethyl Ether	DIG				
Diethylene Glycol Ethyl Ether					
Diethylene Glycol Ethyl Ether Acetate	DGE				
Diethylene Glycol Methyl Ether	DGA	0.99	5,000	4,975	OK
Diethylene Glycol Methyl Ether Acetate	DGM	1.03	5,000	5,074	OK
Diethylene Glycol Phenyl Ether	DGR				
Diethylene Glycol Phthalate	DGP				
Di-(2-ethylhexyl)adipate	DGL				
Di-(2-ethylhexyl)phthalate	DEH				
Diethyl Phthalate	DIE				
	DPH				

CALCULATIONS FOR CAPACITY OF SPILL VALVE
 BARGE: C9706: CONOCO, INC.; E344

MAX DESIGN WORKING PRESS (MDWP) 3.000 PSIG
 SPILL VALVE SET PRESSURE (Ps/v) 1.750 PSIG
 CARGO TANK P/V SETTING (Pp/v) 1.500 PSIG
 "TARGET" MAX LIQUID TRANSFER RATE (TMLTR) 5,000 BPH
 SPILL VALVE CAPACITY (WATER) @ MAX DESIGN WORKING PRESSURE (Qw) max 6,750 BPH

CARGO	C H R I S	LIQUID SPECIFIC GRAVITY (1)	CARGO MAX LIQUID TRANSFER RATE (Q1) (BPH)	EQUIVALENT WATER LIQUID TRANSFER RATE $Q_w = (Q_1) \cdot SG^{1.5}$ (BPH)	$Q_w \leq (Q_w)_{max}$
*** *****					
Diglycidyl Ether of Bisphenol A	BDE				
Diheptyl Phthalate	DHP				
Dihexyl Phthalate	DHA				
Diisobutylcarbinol	DBC	0.81	5,000	4,500	OK
Diisobutylene	DBL	0.72	5,000	4,243	OK
Diisobutyl Ketone	DIK	0.81	5,000	4,500	OK
Diisobutyl Phthalate	DIT				
Diisodecyl Phthalate	DID				
Diisononyl Adipate	DNY				
Diisononyl Phthalate	DIN				
Diisocetyl Phthalate	DIO				
Diisopropylbenzene (all isomers)	DIK	0.86	5,000	4,637	OK
Diisopropyl Naphthalene	DII				
Dimethyl Adipate	DLA				
Dimethylbenzene					
Dimethyl Glutarate	DGT				
Dimethyl Phthalate	DTL	1.19	5,000	5,454	OK
Dimethyl Polysiloxane	DMP				
2,2-Dimethylpropane-1,3-diol	DDI				
Dimethyl Succinate	DSE				
Dinonyl Phthalate	DIF	0.97	5,000	4,924	OK
Di(octylphenyl)amine					
Dioctyl Phthalate	DOP	0.98	5,000	4,950	OK
Dipentene	DPN	0.84	5,000	4,583	OK
Diphenyl	DIL	0.99	5,000	4,975	OK
Diphenyl, Diphenyl Ether mixture	DDO	1.07	5,000	5,172	OK
Diphenyl Ether	DPE	1.07	5,000	5,172	OK
Diphenyl Ether, Biphenyl Ether mixture	DOB				
Dipropylene Glycol	DPG	1.03	5,000	5,074	OK
Dipropylene Glycol Dibenzate	DGY				
Dipropylene Glycol Methyl Ether	DPY				
DISTILLATES: Flashed feed stocks	DFF	0.75	5,000	4,330	OK
DISTILLATES: Straight run	DSR	0.73	5,000	4,272	OK
Ditridecyl Phthalate	DTP				
Diundecyl Phthalate	DUP				
Dodecane (all isomers)	DOC				
Dodecanol	DDN				
Dodecene (all isomers)	DOZ	0.76	5,000	4,359	OK
DODECENE	DOD	0.76	5,000	4,359	OK
Dodecylbenzene	DDB	0.86	5,000	4,637	OK
Dodecyl Phenol	DOL				
Drilling mud (low toxicity) (if flammable or combustible)/					
Epoxylated linear alcohols, C11-C15					
Ethane	ETH	0.47	5,000	3,410	OK
2-Ethoxyethanol	EEO	1.04	5,000	5,099	OK
2-Ethoxyethyl Acetate	EEA	1.04	5,000	5,099	OK
Ethoxylated alcohols, C11-C15, SEE THE ALCOHOL POLYETHOXYLATES					
Ethoxy Triglycol (crude)	ETG	1.02	5,000	5,050	OK
Ethyl Acetate	ETA	0.90	5,000	4,743	OK
Ethyl Acetoacetate	EAA	1.03	5,000	5,074	OK
Ethyl alcohol (ETHANOL)	EAL	0.79	5,000	4,441	OK
Ethyl Amyl Ketone	EAK				
Ethyl Benzene	ETB	0.87	5,000	4,664	OK
Ethyl Butanol	EBT	0.83	5,000	4,555	OK
Ethyl Butyrate	EBR	0.88	5,000	4,690	OK

CALCULATIONS FOR CAPACITY OF SPILL VALVE
 BARGE: C9706: CONOCO, INC.; E344

MAX DESIGN WORKING PRESS (MDWP) 3.000 PSIG
 SPILL VALVE SET PRESSURE (Ps/v) 1.750 PSIG
 CARGO TANK P/V SETTING (Pp/v) 1.500 PSIG
 "TARGET" MAX LIQUID TRANSFER RATE (TMLTR) 5,000 BPH
 SPILL VALVE CAPACITY (WATER) @ MAX DESIGN WORKING PRESSURE (Qw)max 6,750 BPH

CARGO	C H R I S	LIQUID SPECIFIC GRAVITY (1)	CARGO MAX LIQUID TRANSFER RATE (Q1) (BPH)	EQUIVALENT WATER LIQUID TRANSFER RATE $Q_w = (Q_1) \cdot SG^{1.5}$ (BPH)	$Q_w \leq (Q_w)_{max}$
*** *****					
Ethyl Cyclohexane	ECY	0.79	5,000	4,444	OK
Ethylene	ETL				
Ethylene Carbonate					
Ethylene Glycol	EGL	1.13	5,000	5,315	OK
Ethylene Glycol Acetate	EGO				
Ethylene Glycol Butyl Ether	EGM				
ETHYLENE GLYCOL BUTYL ETHER ACETATE	EMA	0.94	5,000	4,848	OK
Ethylene Glycol Ether Acetate					
Ethylene Glycol Tert-Butyl Ether					
Ethylene Glycol Diacetate	EGY	1.10	5,000	5,244	OK
Ethylene Glycol Dibutyl Ether	EGB				
Ethylene Glycol Ethyl Ether, SEE 2-ETHOXYETHANOL	EGF				
Ethylene Glycol Ethyl Ether Acetate, SEE 2-ETHOXYETHYL ACETATE	EGA				
Ethylene Glycol Isopropyl Ether	EGI				
Ethylene Glycol Methyl Butyl Ether					
Ethylene Glycol Methyl Ether	EME	1.10	5,000	5,244	OK
Ethylene Glycol Methyl Ether Acetate	EGT				
Ethylene Glycol Phenyl Ether	EPE	1.10	5,000	5,244	OK
Ethylene Glycol Phenyl Ether, Diethylene Glycol Phenyl Ether mixture	EDX				
Ethylene-Propylene Copolymer (in liquid mixtures)					
Ethyl-3-Ethoxypropionate	EEP				
2-Ethylhexaldehyde, SEE OCTYL ALDEHYDES	EHA	0.82	5,000	4,528	OK
2-Ethylhexanoic acid	EHO				
2-Ethylhexanol, SEE OCTANOL (ALL ISOMERS)	EHX	0.84	5,000	4,583	OK
Ethylhexoic acid, SEE 2-ETHYLHEXANOIC ACID					
Ethyl Hexyl Phthalate (SEE ALSO DI 2-ETHYLHEXYL PHTHALATE)	EHE				
Ethyl Hexyl Tallate	EHT				
Ethyl Propionate	EPR	0.89	5,000	4,717	OK
Ethyl Toluene	ETE	0.88	5,000	4,690	OK
Fatty acid (saturated, C13 and above)					
Fatty acid Amides					
Formamide	FAM	1.13	5,000	5,315	OK
Furfuryl Alcohol	FAL	1.13	5,000	5,315	OK
Gas oil, cracked	GOC				
GASOLINE BLENDING STOCKS: Alkylates	GAK	0.75	5,000	4,330	OK
GASOLINE BLENDING STOCKS: Reformates	GRF	0.80	5,000	4,472	OK
GASOLINES: Automotive (containing not over 4.23 grams lead per gallon)	GAT	0.74	5,000	4,301	OK
GASOLINES: Aviation (containing not over 4.86 grams lead per gallon) Aviation	GAV	0.71	5,000	4,213	OK
GASOLINES: Casinghead (natural)	GCS	0.67	5,000	4,093	OK
GASOLINES: Polymer	GPL	0.75	5,000	4,330	OK
GASOLINES: Straight run	GSR	0.75	5,000	4,330	OK
Glycerine	GCR	1.26	5,000	5,612	OK
Glycerol, SEE GLYCERINE					
Glycerol Polyalkoxylate					
Glycerol Triacetate					
Glycidyl Ester of Tertiary Carboxylic acid, SEE GLYCIDYL ESTER OF TRIDECYL ACETIC ACID					
Glycidyl Ester of Tridecyl Acetic acid	GLT				
Glycidyl Ester of Versatic acid, SEE GLYCIDYL ESTER OF TRIDECYL ACETIC ACID					
Glycol Diacetate, SEE ETHYLENE GLYCOL DIACETATE					
Glycols, Resins and Solvents mixtures					
Glycol Triacetate, SEE GLYCERYL TRIACETATE					
Glyoxal solution (40% or less)					
Grease					
Heptadecane					
Heptane (all isomers) (METHYHEXANE)	HMX	0.68	5,000	4,135	OK

CALCULATIONS FOR CAPACITY OF SPILL VALVE
 BARGE: C9706: CONOCO, INC.; E344

MAX DESIGN WORKING PRESS (MDWP) 3.000 PSIG
 SPILL VALVE SET PRESSURE (P_s/v) 1.750 PSIG
 CARGO TANK P/V SETTING (P_p/v) 1.500 PSIG
 "TARGET" MAX LIQUID TRANSFER RATE (TMLTR) 5,000 BPH
 SPILL VALVE CAPACITY (WATER) @ MAX DESIGN WORKING PRESSURE (Q_w) max 6,750 BPH

CARGO	C H R I S	LIQUID SPECIFIC GRAVITY (1)	CARGO MAX LIQUID TRANSFER RATE (Q1) (BPH)	EQUIVALENT WATER LIQUID TRANSFER RATE Q _w = (Q1) * SG1 ^{1.5} (BPH)	Q _w ≤ (Q _w) max
HEPTANE (N-)	HPT	0.68	5,000	4,123	OK
Heptanoic acid	HEP	0.92	5,000	4,796	OK
Heptanol (all isomers)	HTX	0.82	5,000	4,528	OK
HEPTANOL	HTN	0.82	5,000	4,528	OK
Heptene (all isomers)	HPX	0.70	5,000	4,183	OK
HEPTENE (1-)	HTE	0.70	5,000	4,183	OK
Heptyl Acetate	HPE	0.88	5,000	4,690	OK
Herbicide (C15 -H22 -NO2 -CI), SEE METOLACHLOR					
Hexaethylene Glycol					
Hexamethylene Glycol					
Hexamethylenetetramine solutions					
Hexane (all isomers)	HTS				
HEXANE	HXS	0.66	5,000	4,062	OK
Hexanoic acid	HXA	0.66	5,000	4,062	OK
Hexanol	HXO	0.93	5,000	4,822	OK
Hexene (all isomers)	HXN	0.82	5,000	4,528	OK
HEXENE (1-)	HEX	0.67	5,000	4,093	OK
HEXENE (2-)	HXE	0.67	5,000	4,093	OK
Hexyl Acetate	HXT	0.67	5,000	4,093	OK
Hexylene Glycol	HAE				
Hog Grease, SEE LARD	HXG	0.92	5,000	4,796	OK
2-Hydroxy-4-(methylthio)butanoic acid					
HYDROCARBON 5-9 (MOVED TO SUB-O, NON TABLE 151, 6/24/95)	HBA				
Hydroxy terminated Polybutadiene, SEE POLYBUTADIENE, HYDROXYL TERMINATED/	HPN				
Isophorone					
JET FUELS: JP-1 (Kerosene)	IPH	0.93	5,000	4,822	OK
JET FUELS: JP-3	JPO	0.80	5,000	4,472	OK
JET FUELS: JP-4	JPT	0.80	5,000	4,472	OK
JET FUELS: JP-5 (Kerosene, heavy)	JPF	0.81	5,000	4,500	OK
JET FUELS: JP-8	JPV	0.82	5,000	4,528	OK
Kerosene	JPE				
Lactic acid	KRS	0.81	5,000	4,500	OK
Lard					
Latex, liquid synthetic, including: Styrene-Butadien rubber					
Latex, liquid synthetic, including: Carboxylated Styrene-Butadien Copolymer	LLS				
Magnesium Nonyl Phenol Sulfide					
Magnesium Sulfonate					
Maleic Anhydride Copolymer	MSE				
2-Mercaptobenzothiazol (in liquid mixtures)					
Methane					
3-Methoxy-1-Butanol	MTM				
3-Methoxybutyl Acetate					
1-Methoxy-2-Propyl Acetate	MOA				
Methoxy Triglycol, SEE TRIETHYLENE GLYCOL METHYL ETHER	MPO				
Methyl Acetate	MTG				
Methyl Acetoacetate	MTT	0.92	5,000	4,796	OK
Methyl alcohol (SEE METHANOL)	MAE				
Methyl Amyl Acetate	MAL	0.79	5,000	4,444	OK
Methyl Amyl alcohol	MAC	0.86	5,000	4,637	OK
Methyl Amyl Ketone	MAA	0.81	5,000	4,500	OK
Methyl Butanol, SEE THE AMYL ALCOHOLS	MAK				
Methyl Butenol					
Methyl n-Butyl Ketone	MBL				
Methyl Butynol	MBK	0.81	5,000	4,500	OK
Methyl Butyrate	MBY				
	MBU	0.90	5,000	4,743	OK

CALCULATIONS FOR CAPACITY OF SPILL VALVE
BARGE: C9706: CONOCO, INC.; E344

MAX DESIGN WORKING PRESS (MDWP) 3.000 PSIG
SPILL VALVE SET PRESSURE (Ps/v) 1.750 PSIG
CARGO TANK P/V SETTING (Pp/v) 1.500 PSIG
"TARGET" MAX LIQUID TRANSFER RATE (TMLTR) 5,000 BPH
SPILL VALVE CAPACITY (WATER) @ MAX DESIGN WORKING PRESSURE (Qw)max 6,750 BPH

CARGO	C H I S	LIQUID SPECIFIC GRAVITY (1)	CARGO MAX LIQUID TRANSFER RATE (Q1) (BPH)	EQUIVALENT WATER LIQUID TRANSFER RATE Qw = (Q1) * SG1 ^{.5} (BPH)	Qw <= (Qw) max
*** *****					
Methyl Ethyl Ketone	MEK	0.80	5,000	4,472	OK
Methyl Formal (DIMETHYL FORMAL)	MTF	0.86	5,000	4,637	OK
Methyl Heptyl Ketone	MHK	0.83	5,000	4,555	OK
Methyl Isobutyl Carbinol, SEE METHYL AMYL ALCOHOL	MIC	0.84	5,000	4,583	OK
Methyl Isobutyl Ketone	MIK	0.80	5,000	4,472	OK
3-Methyl-3-Methoxybutanol					
3-Methyl-3-Methoxybutyl Acetate					
1-Methyl Naphthalene	MNA	1.02	5,000	5,050	OK
Methyl Pentene					
2-METHYL-1-PENTENE	MPN	0.69	5,000	4,153	OK
5-METHYL-1-PENTENE	MTN	0.67	5,000	4,093	OK
N-Methyl-2-Pyrrolidone	MPY				
Methyl Tert-Butyl Ether (MTBE)	MBE	0.74	5,000	4,301	OK
Metolachlor	MCO				
Mineral spirits	MNS	0.75	5,000	4,330	OK
Myrcene	MRE	0.80	5,000	4,472	OK
NAPHTHA: Aromatic (Having less than 10% Benzene)	.6	-.85			
NAPHTHA: Cracking fraction	.6	-.85			
NAPHTHA: Heavy	.6	-.85			
NAPHTHA: Paraffinic	.6	-.85			
NAPHTHA: Petroleum	.6	-.85			
NAPHTHA: Solvent	PTN	-.85			
NAPHTHA: Stoddard solvent	NSV	0.87	5,000	4,664	OK
NAPHTHA: Varnish makers' and painters' (75%)	NSS	0.78	5,000	4,416	OK
Naphthalene Sulfonic acid-Formaldehyde Copolymer, Sodium salt solution	NVM	0.77	5,000	4,387	OK
Naphthenic acid	NFS				
Nonane (all isomers)	NTI	1.02	5,000	5,050	OK
NONANE	NAX	0.72	5,000	4,243	OK
Nonanoic acid (all isomers)	NAN	0.72	5,000	4,243	OK
Nonanoic, Tridecanoic acid mixture	NNA				
Nonene	NON	0.73	5,000	4,272	OK
Nonyl alcohol (all isomers)	NNS	0.94	5,000	4,848	OK
NONYL ALCOHOL	NNN	0.94	5,000	4,848	OK
NONYL ALCOHOL (iso-)	NNI	0.94	5,000	4,848	OK
Nonyl Methacrylate Monomer					
Nonyl Phenol	NNP	0.95	5,000	4,873	OK
Nonyl Phenol Poly(4-12)ethoxylates	NPE				
Nonyl Phenol Sulfide (90% or less)					
Noxious liquid, N.O.S. (17) ("Trade name," contains "principal components"), Category D (i					
Non-Noxious liquid, N.O.S. (18) ("Trade name," contains principal components"), Appendix					
Octadecene					
Octadecenoamide solution (Oleamide)	ODD				
Octane (all isomers)	OAX	0.70	5,000	4,183	OK
OCTANE	OAN	0.70	5,000	4,183	OK
Octanoic acid (all isomers)	OAA	0.91	5,000	4,770	OK
Octanol (all isomers)	OCX	0.83	5,000	4,555	OK
OCTANOL	OTA	0.83	5,000	4,555	OK
Octene (all isomers)	OTE	0.72	5,000	4,243	OK
OCTENE (1-)	OTE	0.72	5,000	4,243	OK
Octyl Acetate					
Octyl alcohol (iso-, n-) (all isomers), SEE OCTANOL (ALL ISOMERS)	OCX	0.83	5,000	4,555	OK
OCTYL ALCOHOL	IOA	0.83	5,000	4,555	OK
Octyl Aldehydes	OAL				
Octyl Decyl Adipate	ODA				
Octyl Epoxystallate	OET				

CALCULATIONS FOR CAPACITY OF SPILL VALVE
 BARGE: C9706: CONOCO, INC.; E344

MAX DESIGN WORKING PRESS	(MDWP)	3.000 PSIG
SPILL VALVE SET PRESSURE	(P _{s/v})	1.750 PSIG
CARGO TANK P/V SETTING	(P _{p/v})	1.500 PSIG
"TARGET" MAX LIQUID TRANSFER RATE	(TMLTR)	5,000 BPH
SPILL VALVE CAPACITY (WATER) @ MAX DESIGN WORKING PRESSURE	(Q _w) _{max}	6,750 BPH

CARGO	C H R I S	LIQUID SPECIFIC GRAVITY (1)	CARGO MAX LIQUID TRANSFER RATE (Q _l) (BPH)	EQUIVALENT WATER LIQUID TRANSFER RATE Q _w = (Q _l) * SG ^{1.5} (BPH)	Q _w ≤ (Q _w) _{max}
Octyl Phthalate. SEE DI-(2-ETHYLHEXYL) PHTHALATE					
OIL, EDIBLE: Babassu	ORB				
OIL, EDIBLE: Beechnut					
OIL, EDIBLE: Castor	OCA				
OIL, EDIBLE: Cocoa butter					
OIL, EDIBLE: Coconut	OCC	0.95	5,000	4,884	OK
OIL, EDIBLE: Cod liver					
OIL, EDIBLE: Corn	OCO	0.96	5,000	4,886	OK
OIL, EDIBLE: Cottonseed	OCS				
OIL, EDIBLE: Fish, N.O.S.	OFS	0.96	5,000	4,899	OK
OIL, EDIBLE: Grapeseed					
OIL, EDIBLE: Groundnut					
OIL, EDIBLE: Hazelnut					
OIL, EDIBLE: Lard	OLD				
OIL, EDIBLE: Maize					
OIL, EDIBLE: Mustard seed					
OIL, EDIBLE: Nutmeg Butter					
OIL, EDIBLE: Olive					
OIL, EDIBLE: Palm	OOL				
OIL, EDIBLE: Palm kernel	OPM				
OIL, EDIBLE: Peanut	OPO				
OIL, EDIBLE: Poppy	OPN				
OIL, EDIBLE: Raisin seed					
OIL, EDIBLE: Rice bran	ORP				
OIL, EDIBLE: Safflower	OSF				
OIL, EDIBLE: Salad					
OIL, EDIBLE: Sesame					
OIL, EDIBLE: Soya bean	OSB	0.96	5,000	4,899	OK
OIL, EDIBLE: Sunflower, SEE SUNFLOWER SEED		0.95	5,000	4,873	OK
OIL, EDIBLE: Sunflower seed	OSN				
OIL, EDIBLE: Tucum	OTC				
OIL, EDIBLE: Vegetable, N.O.S.	OVG	0.96	5,000	4,899	OK
OIL, EDIBLE: Walnut					
OIL, FUEL: No. 1 (Kerosene)	OON				
OIL, FUEL: No. 1-D	OOD				
OIL, FUEL: No. 2	OTW	0.88	5,000	4,690	OK
OIL, FUEL: No. 2-D	OTD				
OIL, FUEL: No. 4	OFR	0.90	5,000	4,743	OK
OIL, FUEL: No. 5	OFV	0.94	5,000	4,848	OK
OIL, FUEL: No. 6	OSX	0.95	5,000	4,873	OK
OIL, MISC: Absorption	OAS				
OIL, MISC: Aliphatic					
OIL, MISC: Animal, N.O.S.					
OIL, MISC: Aromatic					
OIL, MISC: Aviation F2300					
OIL, MISC: Clarified	OCF				
OIL, MISC: Coal					
OIL, MISC: Coconut oil, esterified, SEE COCONUT OIL, FATTY ACID METHYL ESTER					
OIL, MISC: Coconut oil, fatty acid					
OIL, MISC: Coconut oil, fatty acid Methyl Ester	OCM				
OIL, MISC: Coconut oil, Methyl Ester, SEE COCONUT OIL FATTY ACID METHYL ESTER					
OIL, MISC: Cottonseed, fatty acid, SEE COTTONSEED OIL, FATTY ACID	CFY	0.95	5,000	4,873	OK
OIL, MISC: Croton					
OIL, MISC: Crude	OIL	0.95	5,000	4,873	OK
OIL, MISC: Diesel	ODS	0.90	5,000	4,743	OK

CALCULATIONS FOR CAPACITY OF SPILL VALVE
 BARGE: C9706: CONOCO, INC.; E344

MAX DESIGN WORKING PRESS	(MDWP)	3.000 PSIG
SPILL VALVE SET PRESSURE	(P _{s/v})	1.750 PSIG
CARGO TANK P/V SETTING	(P _{p/v})	1.500 PSIG
"TARGET" MAX LIQUID TRANSFER RATE	(TMLTR)	5,000 BPH
SPILL VALVE CAPACITY (WATER) @ MAX DESIGN WORKING PRESSURE	(Q _w)max	6,750 BPH

C H R I S	LIQUID SPECIFIC GRAVITY	CARGO MAX LIQUID TRANSFER RATE (Q _l) (BPH)	EQUIVALENT WATER LIQUID TRANSFER RATE Q _w = (Q _l) * SG ^{1.5} (BPH)	Q _w <= (Q _w)max
CARGO	(1)			
*** *****				
OIL, MISC: Gas, low pour				
OIL, MISC: Gas, low sulfur				
OIL, MISC: Heartcut distillate				
OIL, MISC: Lanolin				
OIL, MISC: Linseed				
OIL, MISC: Lubricating	OLB	0.90 5,000	4,743	OK
OIL, MISC: Mineral				
OIL, MISC: Mineral seal	OMS			
OIL, MISC: Motor	OMT			
OIL, MISC: Neatsfoot	ONF			
OIL, MISC: Oiticica	OOI			
OIL, MISC: Palm oil, fatty acid Methyl Ester	OPE	0.95 5,000	4,873	OK
OIL, MISC: Palm oil, Methyl Ester, SEE SEE PALM OIL, FATTY ACID METHYL ESTER	OPT			
OIL, MISC: Penetrating				
OIL, MISC: Perilla				
OIL, MISC: Pilchard				
OIL, MISC: Pine	OPI			
OIL, MISC: Range	ORG			
OIL, MISC: Residual				
OIL, MISC: Resin	ORS	1.02 5,000	5,050	OK
OIL, MISC: Resinous petroleum				
OIL, MISC: Road	ORD			
OIL, MISC: Rosin	ORN			
OIL, MISC: Seal				
OIL, MISC: Soapstock	OIS			
OIL, MISC: Soya bean (epoxidized)				
OIL, MISC: Sperm	OSP			
OIL, MISC: Spindle	OSD			
OIL, MISC: Spray	OSY			
OIL, MISC: Tall	OTL			
OIL, MISC: Tall, fatty acid	TOP			
OIL, MISC: Tanner's	OTN			
OIL, MISC: Transformer	OTF			
OIL, MISC: Tung	OTG			
OIL, MISC: Turbine	OTB	0.87 5,000	4,664	OK
OIL, MISC: Whale				
OIL, MISC: White (mineral)				
OIL, MISC: Wood				
alpha-Olefins (C13 - C18)	OAM			
Olefins (C13 and above, all isomers)	OLA	0.72 5,000	4,243	OK
Oleic acid				
Oleyl alcohol (OCTADECENOL), SEE ALCOHOLS (C13 AND ABOVE)				
Organic Amine 70, SEE AMINOETHYLDIETHANOLAMINE, AMINOETHYL-ETHANOLAMINE SOLUTION				
Palm Stearin	PMS			
n-Paraffins (C10 - C20)	PFN			
Pentadecanol, SEE SEE ALCOHOLS (C13 AND ABOVE)	PDC	0.83 5,000	4,555	OK
Pentaethylene Glycol				
Pentaethylenhexamine	PEP			
Pentane (all isomers)	PTY	0.63 5,000	3,957	OK
PENTANE (iso-)	IPT	0.62 5,000	3,937	OK
PENTANE (n-)	PTA	0.63 5,000	3,969	OK
Pentanoic acid				
Pentene (all isomers)	PTX	0.64 5,000	4,000	OK
PENTENE (1-)	PTE	0.64 5,000	4,000	OK
Petrolatum	PTL			

CALCULATIONS FOR CAPACITY OF SPILL VALVE
BARGE: C9706: CONOCO, INC.; E344

MAX DESIGN WORKING PRESS
SPILL VALVE SET PRESSURE
CARGO TANK P/V SETTING
"TARGET" MAX LIQUID TRANSFER RATE
SPILL VALVE CAPACITY (WATER) @ MAX DESIGN WORKING PRESSURE

(MDWP) 3.000 PSIG
(Ps/v) 1.750 PSIG
(Pp/v) 1.500 PSIG
(TMLTR) 5,000 BPH
(Qw) max 6,750 BPH

C H R I S	LIQUID SPECIFIC GRAVITY (1)	CARGO MAX LIQUID TRANSFER RATE (Q1) (BPH)	EQUIVALENT WATER LIQUID TRANSFER RATE $Q_w = (Q1) \cdot SG1^{.5}$ (BPH)	$Q_w \leq (Q_w) \text{ max}$
CARGO				
*** *****				
1-Phenyl-1-Xylol Ethane	PXE			
Phosphosulfurized Bicyclic Terpene				
Phthalate plasticizers, SEE INDIVIDUAL PHTHALATES				
Pinene	PIN	0.86	5,000	4,637 OK
Polyalkenyl Succinic Anhydride Amine				
Polyalkylene Glycols, Polyalkylene Glycol Monoalkyl Ethers mixtures	PPX			
Polyalkylene Oxide Polyol	PAO	1.04	5,000	5,099 OK
Polamine, Amide mixture				
Polybutadiene, Hydroxyl terminated				
Polybutene	PLB	0.91	5,000	4,770 OK
Polydimethylsiloxane		1.04	5,000	5,099 OK
Polyethylene Glycol		1.04	5,000	5,099 OK
Polyethylene Glycol Dimethyl Ether				
Polyglycerol				
Polyisobutylene, SEE POLYBUTENE				
Polymerized Esters				
Poly(20)oxyethylene Sorbitan Monooleate	PSM			
Polypropylene	PLP			
Polypropylene Glycol	PGC	1.01	5,000	5,025 OK
Polypropylene Glycol Methyl Ether	PGM	0.92	5,000	4,796 OK
Polysiloxane				
Polystyrene Diakyl Maleate				
Potassium Oleate				
Propane	POE			
n-Propoxypropanol	PRP	1.04	5,000	5,099 OK
Propyl Acetate (iso-)	PXP			
Propyl Acetate (n-)	IAC	0.89	5,000	4,717 OK
Propyl alcohol (iso-)	PAT	0.00		
Propyl alcohol (n-)	IPA	0.79	5,000	4,444 OK
Propylbenzene (n-)	PAL	0.80	5,000	4,472 OK
iso-Propylcyclohexane	PBZ	0.86	5,000	4,637 OK
Propylene	IPX	0.80	5,000	4,472 OK
Propylene-Butylene Copolymer	PPL	1.04	5,000	5,099 OK
Propylene Dimer	PBP			
Propylene Glycol (1,2-PROPANDIOL)	PDR			
Propylene Glycol Monoalkyl Ether	PPG	1.04	5,000	5,099 OK
Propylene Glycol Ethyl Ether	PGE			
Propylene Glycol Methyl Ether	PGY			
Propylene Polymer (in liquid mixtures)	PME	0.92	5,000	4,796 OK
Propylene Tetramer	PTT	0.29	5,000	2,693 OK
Propylene Trimer	PTR			
Pseudocumene, SEE TRIMETHYLBENZENES				
Rum				
Sodium Acetate, Glycol, water solutions				
Sodium Acetate solution	SAN			
Sodium Benzoate solution	SBN			
Sodium Sulfonate				
Stearic acid	SRA			
Stearyl alcohol (Octadecanol)				
Sulfolane	SFL	1.26	5,000	5,612 OK
Tallow	TLO			
Tallow alcohol, SEE ALCOHOLS (C13 AND ABOVE)				
Tallow fatty acid	TFD			
Tallow Alkyl Nitrile				
Tetradecanol	TTN	0.82	5,000	4,528 OK

CALCULATIONS FOR CAPACITY OF SPILL VALVE
 BARGE: C9706: CONOCO, INC.; E344

MAX DESIGN WORKING PRESS (MDWP) 3,000 PSIG
 SPILL VALVE SET PRESSURE (Ps/v) 1,750 PSIG
 CARGO TANK P/V SETTING (Pp/v) 1,500 PSIG
 "TARGET" MAX LIQUID TRANSFER RATE (TMLTR) 5,000 BPH
 SPILL VALVE CAPACITY (WATER) @ MAX DESIGN WORKING PRESSURE (Qw) max 6,750 BPH

CARGO	C H R I S	LIQUID SPECIFIC GRAVITY (1)	CARGO MAX LIQUID TRANSFER RATE (Q1) (BPH)	EQUIVALENT WATER LIQUID TRANSFER RATE $Q_w = (Q1) \cdot SG1^{1.5}$ (BPH)	$Q_w \leq (Q_w)_{max}$
1-Tetradecene, SEE THE OLEFIN OR ALPHA-OLEFIN ENTRIES	TTD	0.77	5,000	4,387	OK
Tetradecylbenzene	TBD				
Tetraethylene Glycol	TTG	1.12	5,000	5,292	OK
Tetrahydronaphthalene	THN	0.97	5,000	4,924	OK
Tetrapropylbenzene, SEE ALKYL(C9-C17) BENZENES					
Toluene	TOL	0.87	5,000	4,664	OK
Triaryphosphate					
Tributyl Phosphate	TBP				
Tricresyl Phosphate (less than 1% of the ortho isomer)	TCP	1.16	5,000	5,385	OK
Tridecane	TRD	0.76	5,000	4,359	OK
Tridecanoic acid					
Tridecanol, SEE ALCOHOLS (C13 AND ABOVE)	TDN	0.85	5,000	4,610	OK
1-Tridecene	TDC	0.77	5,000	4,387	OK
Tridecylbenzene	TRB				
Triethylbenzene	TEB	0.86	5,000	4,637	OK
Triethylene Glycol	TEG	1.12	5,000	5,292	OK
Triethylene Glycol Butyl Ether					
Triethylene Glycol Butyl Ether mixture		1.04	5,000	5,099	OK
Triethylene Glycol di-(2-ethylbutyrate)	TGD				
Triethylene Glycol Ether mixture					
Triethylene Glycol Ethyl Ether	TGE				
Triethylene Glycol Methyl Ether					
Triethyl Phosphate	TPS	1.07	5,000	5,172	OK
Triisooctyl Trimellitate					
Triisopropanolamine	TIP	1.02	5,000	5,050	OK
Trimethylbenzenes (all isomers)	TRE	0.89	5,000	4,717	OK
TRIMETHYL BENZENE (1,2,5-)	TMB	0.89	5,000	4,717	OK
TRIMETHYL BENZENE (1,2,3-)	TMD	0.89	5,000	4,717	OK
TRIMETHYL BENZENE (1,2,4-) (PSEUDOCUMENE)	TME	0.89	5,000	4,717	OK
Trimethylol Propane Polyethoxylate	TPR				
2,2,4-Trimethyl pentanediol-1,3-diisobutyrate					
2,2,4-Trimethyl-3-pentanol-1-isobutyrate	TMP				
Tripropylene, SEE PROPYLENE TRIMER					
Tripropylene Glycol	TGC				
Tripropylene Glycol Methyl Ether	TGM				
Trixylenyl Phosphate	TRP	1.16	5,000	5,385	OK
Turpentine	TPT				
Turpentine substitute (White spirit), SEE WHITE SPIRIT (LOW (15-20%) AROMATIC)					
Undecanol					
Undecene (1-)	UDC	0.75	5,000	4,330	OK
Undecyl alcohol	UND	0.84	5,000	4,583	OK
Undecylbenzene	UDB				
Vinyl Acetate-fumurate Copolymer					
Waxes:	WAX				
WAXES: Candelilla					
WAXES: Carnauba	WAX, WCA				
WAXES: Paraffin	WAX, WPF				
WAXES: Petroleum					
White spirit, SEE WHITE SPIRIT (LOW (15-20%) AROMATIC)					
White spirit (low (15 - 20%) aromatic)	WSL				
Wine, SEE ALCOHOLIC BEVERAGES, N.O.S.					
Wool grease					
Xylenes (ortho-, meta-, para-)	XLX	0.89	5,000	4,717	OK
XYLENE (M-)	XLM	0.87	5,000	4,664	OK
XYLENE (O-)	XLO	0.89	5,000	4,717	OK

CALCULATIONS FOR CAPACITY OF SPILL VALVE
 BARGE: C9706; CONOCO, INC., E344

MAX DESIGN WORKING PRESS	(MDWP)	3.000 PSIG
SPILL VALVE SET PRESSURE	(Ps/v)	1.750 PSIG
CARGO TANK P/V SETTING	(Pp/v)	1.500 PSIG
"TARGET" MAX LIQUID TRANSFER RATE	(TMLTR)	5,000 BPH
SPILL VALVE CAPACITY (WATER) @ MAX DESIGN WORKING PRESSURE	(Qw) max	6,750 BPH

	C H R I S	LIQUID SPECIFIC GRAVITY (1)	CARGO MAX LIQUID TRANSFER RATE (Q1) (BPH)	EQUIVALENT WATER LIQUID TRANSFER RATE $Q_w = (Q1) \cdot SG1^{.5}$ (BPH)	$Q_w \leq (Q_w)_{max}$
CARGO					
*** *****					
XYLENE (P-)	XLP	0.86	5,000	4,637	OK
XYLENOL	XYL	1.01	5,000	5,025	OK
Zinc Dialkyldithiophosphate					

CALCULATIONS FOR CAPACITY OF SPILL VALVE
 BARGE: C9706: CONOCO, INC.; E344

MAX DESIGN WORKING PRESS	(MDWP)	3.000 PSIG
SPILL VALVE SET PRESSURE	(Ps/v)	1.750 PSIG
CARGO TANK P/V SETTING	(Pp/v)	1.500 PSIG
"TARGET" MAX LIQUID TRANSFER RATE	(TMLTR)	5,000 BPH
SPILL VALVE CAPACITY (WATER) @ MAX DESIGN WORKING PRESSURE	(Qw)max	6,750 BPH

	C	LIQUID	CARGO	EQUIVALENT	
	H	SPECIFIC	MAX	WATER	
	R	GRAVITY	LIQUID	LIQUID	Qw <= (Qw) max
	I		TRANSFER	TRANSFER	
	S		RATE	RATE	
CARGO		(1)	(Q1)	Qw = (Q1) * SG1 ^{.5}	
			(BPH)	(BPH)	

46 CFR SUBCHAPTER D, BUT NOT TABLE 30.25-1

AROMATIC RESIN OIL 60	ARS	1.02	5,000	5,050	OK
AROMATIC RESIN OIL 80	ARS	1.02	5,000	5,050	OK
AROMATIC RESIN OILS					
			999		

SUMMARY COMPARISON OF "SPILL VALVE" vs "P/V" MAX LIQUID TRANSFER RATES
 BARGE: C9706: CONOCO, INC.; E344

CARGO	C H R I S	MAX LIQUID TRANSFER RATE PER SPILL VALVE (BBL/ HR)	MAX LIQUID TRANSFER RATE PER P/V VALVE (BBL/ HR)
----- *** -----			
46 CFR SUBCHAPT O, TABLE 151			

ACETIC ACID	AAC	5,000	5,000
ACETIC ANHYDRIDE	ACA	5,000	5,000
ACETONITRILE	ATN	5,000	5,000
ACRYLIC ACID	ACR	5,000	5,000
ACRYLONITRILE	ACN	5,000	5,000
ADIPONITRILE	ADN	5,000	5,000
ALUMINUM SULFATE SOLUTION	ASX	5,000	
AMINOETHYLETHANOLAMINE	AEE	5,000	5,000
AMMONIUM BISULFITE SOLN (70% OR LESS)	ABX	5,000	
AMMONIUM HYDROXIDE (28% OR LESS NH3)	AMH		
ANTHRACENE OIL (COAL TAR FRACTION)	AHO		
BENZENE	BNZ	5,000	5,000
BENZENE HYDROCARBON MIXTURES (W/ACETYLENES) (W/10% BENZENE OR MORE)	BHA	5,000	5,000
BENZENE HYDROCARBON MIXTURES (W/10% BENZENE OR MORE)	BHB	5,000	5,000
BENZENE, TOLUENE, XYLENE MIXTURES (HAVING 10% BENZENE OR MORE)	BTX	5,000	5,000
iso-BUTYL ACRYLATE	BAI	5,000	5,000
n-BUTYL ACRYLATE	BTC	5,000	5,000
BUTYL ACRYLATE (SEE ISO- & N- BUTYL ACRYLATE)	BAR	5,000	5,000
BUTYL METHACRYLATE	BMH	5,000	5,000
iso-BUTYRALDEHYDE	BAD	5,000	5,000
n-BUTYRALDEHYDE	BTR	5,000	5,000
BUTYRALDEHYDES (CRUDE)	BFA	5,000	5,000
BUTYRALDEHYDE (ISO-, N-)	BAE	5,000	5,000
CAMPHOR OIL (LIGHT)	CPO	5,000	
CARBON TETRACHLORIDE	CBT	5,000	
CAUSTIC POTASH SOLUTION	CPS	5,000	
CAUSTIC SODA SOLUTION	CSS	5,000	
CHLOROBENZENE	CRB	5,000	5,000
CHLOROFORM	CRF	5,000	
CHLOROSULFONIC ACID	CSA	5,000	
COAL TAR NAPHTHA SOLVENT	NCT	5,000	5,000
CREOSOTE (COAL TAR)	CCT	5,000	5,000
CREOSOTE (WOOD)	CWD	5,000	5,000
CRESOLS (ALL ISOMERS)	CRS	5,000	5,000
CRESOLS WITH LESS THAN 5% PHENOL (SEE CRESOLS (ALL ISOMERS))	CRS	5,000	
CRESOLS WITH 5% OR MORE PHENOL (SEE PHENOL)	CFP	5,000	5,000
CRESYLATE SPENT CAUSTIC	CSC	5,000	
CRESYLIC ACID, SODIUM SALT SOLUTION, SEE CRESYLATE SPENT CAUSTIC	CAX		
CROTONALDEHYDE	CTA	5,000	5,000
CYCLOHEXANONE	CCH	5,000	5,000
CYCLOHEXYLAMINE	CHA	5,000	5,000
DECYL ACRYLATE (iso-, n-)	DAT	5,000	5,000
DICHLOROBENZENE (ALL ISOMERS)	DBX	5,000	5,000
1,1-DICHLOROETHANE	DCH	5,000	5,000
2,2-DICHLOROETHYL ETHER	DEE	5,000	5,000
DICHLOROMETHANE (ALSO KNOWN AS METHYLENE CHLORIDE)	DCM	5,000	
2,4-DICHLOROPHENOXYACETIC ACID DIETHANOLAMINE SALT SOLUTION	DDE		
2,4-DICHLOROPHENOXYACETIC ACID, DIMETHYLAMINE SALT SOLUTION	DAD		
2,4-DICHLOROPHENOXYACETIC ACID, TRIISOPROPANOLAMINE SALT SOLUTION	DTI		
1,1-,1,2- OR 1,3- DICHLOROPROPANE	DPX	5,000	5,000
1,3-DICHLOROPROPENE	DFU	5,000	5,000
DICHLOROPROPENE, DICHLOROPROPANE MIXTURES	DMX	5,000	5,000
2,2-DICHLOROPROPIONIC ACID	DCN		
DIETHANOLAMINE	DEA	5,000	5,000
DIETHYLAMINE	DEN	5,000	5,000
DIETHYLENETRIAMINE	DET	5,000	5,000
DIETHYL ETHER, SEE ETHYL ETHER	DEH		

SUMMARY COMPARISON OF "SPILL VALVE" vs "P/V" MAX LIQUID TRANSFER RATES
 BARGE: C9706: CONOCO, INC.; E344

CARGO	C H R I S	MAX LIQUID TRANSFER RATE PER SPILL VALVE (BBL/ HR)	MAX LIQUID TRANSFER RATE PER P/V VALVE (BBL/ HR)

DIISOBUTYLAMINE	DBU	5,000	5,000
DIISOPROPANOLAMINE	DIP	5,000	5,000
DIISOPROPYLAMINE	DIA	5,000	5,000
N,N-DIMETHYLACETAMIDE	DAC	5,000	5,000
DIMETHYLETHANOLAMINE	DMB	5,000	5,000
DIMETHYLFORMAMIDE	DMF	5,000	5,000
1,4-DIOXANE	DOX	5,000	5,000
DI-N-PROPYLAMINE	DNA	5,000	5,000
ETHANOLAMINE	MEA	5,000	5,000
ETHYL ACRYLATE	EAC	5,000	5,000
ETHYLAMINE SOLUTION (72% OR LESS)	EAN	5,000	5,000
N-ETHYLBUTYLAMINE	EBA	5,000	5,000
N-ETHYLCYCLOHEXYLAMINE	ECC	5,000	5,000
ETHYLENE CYANOHYDRIN	ETC	5,000	5,000
ETHYLENEDIAMINE	EDA	5,000	5,000
ETHYLENE DIBROMIDE	EDB	4,582	
ETHYLENE DICHLORIDE	EDC	5,000	5,000
ETHYLENE GLYCOL PROPYL ETHER	EGP	5,000	5,000
2-ETHYLHEXYL ACRYLATE	EAI	5,000	5,000
ETHYLIDENE NORBORNENE	ENB	5,000	5,000
ETHYL METHACRYLATE	ETM	5,000	5,000
2-ETHYL-3-PROPYLACROLEIN	EPA	5,000	5,000
FERRIC CHLORIDE SOLUTIONS	FCS		
FORMALDEHYDE SOLUTION (37% TO 50%)	FMS	5,000	5,000
FORMIC ACID	FMA	5,000	5,000
FURFURAL	FFA	5,000	5,000
GLUTARALDEHYDE SOLUTION (50% OR LESS)	GTA		
HEXAMETHYLENEDIAMINE SOLUTION	HMC	5,000	5,000
HEXAMETHYLENEIMINE	HMI	5,000	5,000
HYDROCHLORIC ACID SPENT (15% OR LESS)	HCS	5,000	
ISOPENTALDEHYDE (MIXED ISOMERS) (SEE VALERALDEHYDE (ISO-, N-))			
ISOPRENE	IPR	5,000	5,000
KRAFT PULPING LIQUORS (FREE ALKALI CONTENT 3% OR MORE) (INCLUDING: BLACK,	KPL		
MESITYL OXIDE	MSO	5,000	5,000
METHYL ACRYLATE	MAM	5,000	5,000
METHYLCYCLOPENTADIENE DIMER	MCK	5,000	5,000
METHYL DIETHANOLAMINE	MDE	5,000	5,000
2-METHYL-5-ETHYLPYRIDINE	MEP	5,000	5,000
METHYLENE CHLORIDE (SEE DICHLOROMETHANE)			
METHYL METHACRYLATE	MMM	5,000	5,000
2-METHYLPYRIDINE	MPR	5,000	5,000
alpha-METHYLSTYRENE	MSR	5,000	5,000
MORPHOLINE	MPL	5,000	5,000
NITRIC ACID (70% OR LESS)	NCD		
NITROPROPANE (-1, OR -2)	NPM	5,000	5,000
OCTYL NITRATES (ALL ISOMERS)	ONE	5,000	5,000
OLEUM	OLM	4,797	5,000
PENTACHLOROETHANE	PCE	5,000	
1, 3-PENTADIENE	PDE	5,000	5,000
PERCHLOROETHYLENE (SAME AS TETRACHLOROETHYLENE)	PER	5,000	
PHOSPHORIC ACID	PAC	4,990	
POLYETHYLENE POLYAMINES	PFB	5,000	5,000
POLYMETHYLENE POLYPHENYL ISOCYANATE	PPI	5,000	
POTASSIUM HYDROXIDE SOLUTION (SEE CAUSTIC POTASH SOLUTION)			
iso-PROPANOLAMINE	MPA	5,000	5,000
PROPANOLAMINE (iso-, n-)	PAX	5,000	5,000
PROPIONIC ACID	PNA	5,000	5,000
iso-PROPYLAMINE	IPP	5,000	5,000
iso-PROPYL ETHER	IPE	5,000	5,000
PYRIDINE	PRD	5,000	5,000
SODIUM ALUMINATE SOLUTION	SAU		

SUMMARY COMPARISON OF "SPILL VALVE" vs "P/V" MAX LIQUID TRANSFER RATES
 BARGE: C9706: CONOCO, INC.; E344

CARGO	C H R I S	MAX LIQUID TRANSFER RATE PER SPILL VALVE (BBL/ HR)	MAX LIQUID TRANSFER RATE PER P/V VALVE (BBL/ HR)

SODIUM CHLORATE SOLUTION (50% OR LESS)	SDD	5,000	
SODIUM DICHROMATE SOL'N (70% OR LESS)	SDL		
SODIUM HYDROXIDE SOLUTION (SEE CAUSTIC SODA SOLUTION)			
SODIUM HYPOCHLORITE SOL'N (15% OR LESS)	SHP	5,000	
SODIUM SULFIDE, HYDROSULFIDE SOLUTIONS (H2S 15 PPM OR LESS)	SSH	5,000	
SODIUM SULFIDE HYDROSULFIDE SOLUTIONS (15 PPM<H2S<200 PPM)	SSI	5,000	
SODIUM SULFIDE HYDROSULFIDE SOLUTIONS (H2S GREATER THAN 200 PPM)	SSJ	5,000	
SODIUM THIOCYANATE SOLUTION (56% OR LESS)	STS		
STYRENE MONOMER	STY	5,000	5,000
SULFURIC ACID	SFA	4,976	5,000
SULFURIC ACID, SPENT	SAC	5,000	5,000
1,1,2,2-TETRACHLOROETHANE (ACETYLENE TETRACHLORIDE)	TEC	5,000	
TETRAETHYLENEPENTAMINE	TEP	5,000	5,000
TETRAHYDROFURAN	THF	5,000	5,000
1,1,2-TRICHLOROETHANE (VINYL TRICHLORIDE)	TCM	5,000	5,000
TRICHLOROETHANE (SEE 1,1,2-TRICHLOROETHANE)			
TRICHLOROETHYLENE	TCL	5,000	5,000
1,2,3-TRICHLOROPROPANE	TCN	5,000	5,000
TRIETHANOLAMINE	TEA	5,000	5,000
TRIETHYLAMINE	TEN	5,000	5,000
TRIETHYLENETETRAMINE	TET	5,000	5,000
UREA, AMMONIUM NITRATE SOL'N (CONTAINING MORE THAN 2% NH3)	UAS		
VALERALDEHYDE (iso-, n-)		5,000	5,000
VALERALDEHYDE (iso-)	IVA	5,000	5,000
VALERALDEHYDE (n-)	VAL	5,000	5,000
VANILLAN BLACK LIQUOR (FREE ALKALI CONTENT 3% OR MORE)	VBL		
VINYL ACETATE	VAM	5,000	5,000
VINYLTOLUENE	VNT	5,000	5,000

SUMMARY COMPARISON OF "SPILL VALVE" vs "P/V" MAX LIQUID TRANSFER RATES
 BARGE: C9706: CONOCO, INC.; E344

CARGO	C H R I S	MAX LIQUID TRANSFER RATE PER SPILL VALVE (BBL/ HR)	MAX LIQUID TRANSFER RATE PER P/V VALVE (BBL/ HR)
----- *** -----			
46 CFR SUBCHAPT O BUT NOT TABLE 151 *****			
1,1-DICHLOROPROPANE	DPB	5,000	5,000
1,1,1-TRICHLOROETHANE		5,000	
1,2-DICHLOROPROPANE	DPP	5,000	5,000
1,3 CYCLOPENTADIENE			
1,3-DICHLOROPROPANE	DPC	5,000	5,000
2-METHYL-2-HYDROXY-3-BUTYNE	MHB	5,000	5,000
2,4-DICHLOROPHENOXYACETIC ACID, DIMETHYLAMINE SALT SOLUTION (70% OR LESS)	DDA		
3-PENTENENITRILE	PNT		
AEROTHENE TT (1,1,1-TRICHLOROETHANE)			
ALKYLBENZENE			
AMINOETHYLPIPERAZINE	AEP		
BENZENE RAFFINATE (ASSUME VAPOR PROPERTIES SIMILAR TO BENZENE)		5,000	5,000
BENZENE SULFONYL CHLORIDE	BSC	5,000	5,000
BENZYL ACETATE	BZE	5,000	5,000
BENZYL CHLORIDE (STABILIZED)	BCL	5,000	5,000
BUTANOL			
BUTYL ETHER (n-)	BTE	5,000	5,000
BUTYLENE OXIDE (1,2-)	BTO	5,000	5,000
BUTYRIC ACID	BRA	5,000	5,000
CARBOLIC ACID	CBO	5,000	5,000
CHLOROACETIC ACID (80% OR LESS)	CHM	5,000	5,000
CHLOROPROPIONIC ACID (2- OR 3-)	CPM	5,000	5,000
CHLOROTOLUENE (m-)	CTM	5,000	5,000
CHLOROTOLUENE (o-)	CTO	5,000	5,000
CHLOROTOLUENE (p)	CRN	5,000	5,000
CHLOROTOLUENES (MIXED ISOMERS)	CHI	5,000	5,000
CREOSOTE (ALL ISOMERS)	CCW	5,000	5,000
CRESYLIC ACID TAR	CRX	5,000	5,000
CYCLOHEPTANE	CYE	5,000	5,000
CYCLOHEXANONE, CYCLOHEXANOL MIXTURE	CYX	5,000	5,000
CYCLOHEXYL ACETATE	CYC	5,000	5,000
CYCLOPENTADIENE, STYRENE, BENZENE MIXTURE	CSB	5,000	5,000
CYCLOPENTANE	CYP	5,000	5,000
DECANOIC ACID	DCO	2,770	
DI 2 ETHYLHEXYL PHTHALATE (SEE ALSO ETHYLHEXYL PHTHALATE)		5,000	
DICHLOROISOPROPYL ETHER (2,2'-)	DCI	5,000	5,000
DICHLOROPROPANE		5,000	
DICHLOROPROPENE		5,000	
DIETHYL SULFATE	DSU	5,000	5,000
DIETHYLETHANOLAMINE	DAE	5,000	5,000
DODECYL BENZENE			
DODECYLDIMETHYLAMINE TETRADECYLDIMETHYLAMINE MIXTURE	DOT		
DRIPOLENE			
ETHANOL (see ethyl alcohol)			
ETHYL BROMIDE	EBE	5,000	5,000
ETHYL TERT-BUTYL ETHER	EAM	5,000	5,000
ETHYLAMINE	ETX	5,000	5,000
ETHYLENE DICHLORIDE 1,1,2-TRICHLOROETHANE MIXTURE			
ETHYLMERCAPTAN (SAME AS ETHANETHIOL)			
ETHYLPHENOL	EPL	5,000	5,000
FORMALDEHYDE SOLUTION (50% OR MORE), METHANOL MIXTURES	MTM	5,000	5,000
HYDROSULFIDE			
INDENES			
ISOBUTYL ACETATE	IBA		5,000
ISOPRENE, PENTADIENE MIXTURE	IPN		
ISO-PROPYL ALCOHOL		5,000	5,000
LAURIC ACID	LRA	5,000	
METHACRYLONITRILE	MET	5,000	5,000

SUMMARY COMPARISON OF "SPILL VALVE" vs "P/V" MAX LIQUID TRANSFER RATES
 BARGE: C9706: COSOCO, INC.; E344

CARGO	C H R I S	MAX LIQUID TRANSFER RATE PER SPILL VALVE (BBL/ HR)	MAX LIQUID TRANSFER RATE PER P/V VALVE (BBL/ HR)
		***	***
METHANOL		5,000	
METHYL STYRENE			
METHYL STYRENE, INDENES, ALKYL BENZENE MIXTURES	MIA		
METHYLCYCLOHEXANE	MCY	5,000	5,000
METHYLHEXANE (SAME AS HEPTANE)			
MONOETHANOLAMINE	MEA	5,000	5,000
MONOISOPROPANOLAMINE		5,000	5,000
NAPHTHALENE (MOLTEN)	NTM	5,000	5,000
NEODECANOIC ACID	NEA	5,000	5,000
NITRILOTRIACETIC ACID	NAA		
NITROPHENOL (MOLTEN)	NTP	5,000	
NITROPROPANE (60%), NITROETHANE (40%) MIXTURE	NNM	5,000	5,000
NITROTOLUENE (o-,p-)	NIT	5,000	5,000
PARALDEHYDE	PDH	5,000	5,000
POLYGLYCERINE, SODIUM SALT SOLN (CONTAINING 3% OR MORE SODIUM HYDROXIDE)	PGS		
PROPIONALDEHYDE	PAD	5,000	5,000
PROPIONIC ANHYDRIDE	PAH	5,000	5,000
PROPIONITRILE	PCN	5,000	5,000
PROPYLAMINE (n-)	PRA	5,000	5,000
PROPYLBENZENE			5,000
PYROLYSIS GASOLINE (GREATER THAN 5% BENZENE)	GPY	5,000	5,000
PYROLYSIS RESIDUAL FUELS		5,000	
SEWAGE, RAW	SWR		
SODIUM SULFIDE (SOLID IN WATER)	SDS	5,000	
STYRENE	STY	5,000	5,000
STYRENE CRUDE	STX	5,000	5,000
STYRENE TAR	STT		
TETRAMETHYLBENZENE (1,2,3,5-)	TTB	5,000	5,000
TOLUIDINE (o-)	TLI	5,000	5,000
TRICHLOROBENZENE (1,2,4-)	TCB	5,000	5,000
TRIIISOPROPANOLAMINE SALT OF 2,4-DICHLOROPHENOXY ACETIC ACID SOL'N			
TRIPHENYLBORANE	TPE		
UNDECANOIC ACID	UDA	5,000	
HYDROCARBON 5-9	HFN	5,000	5,000

SUMMARY COMPARISON OF "SPILL VALVE" vs "P/V" MAX LIQUID TRANSFER RATES
 BARGE: C9706: CONOCO, INC.; E344

CARGO	C H R I S	MAX LIQUID TRANSFER RATE PER SPILL VALVE (BBL/ HR)	MAX LIQUID TRANSFER RATE PER P/V VALVE (BBL/ HR)
----- *** -----			
46 CFR SUBCHAPTER D, TABLE 30.25-1 *****			
Acetone	ACT	5,000	5,000
Acetophenone	ACP	5,000	5,000
Acetyl Tributyl Citrate		5,000	
Acrylonitrile-Styrene Copolymer dispersion in Polyether Polyol	ALE		
Alcohols (C13 and above)	ALY		
Alcoholic beverages, N.O.S.			
Alcohol (C6 - C17) (secondary) Poly(3-6)ethoxylates			
Alcohol (C12 - C15) Poly(1-3)ethoxylates			
Alcohol (C12 - C15) Poly(3-11)ethoxylates			
Alkenylsuccinic acid			
Alkenylsuccinic Anhydride			
Alkyl (C9 - C17) Benzenes	AKB		
Alkylbenzenesulfonic acid (4% or less)	ABS		
Alkyl Phthalates (n-)			
Alkyl Succinate Formaldehyde Hydr- oxyamino condensate (3.2% or less)			
Aminoethyldiethanolamine, Aminoethylethanolamine solution			
Amyl Acetate (commercial, iso-, n-, sec-)	AEC	5,000	5,000
AMYL ACETATE (n-)	AML	5,000	5,000
AMYL ACETATE (iso-)	IAT	5,000	5,000
Amyl alcohol (iso-, n-, sec-, primary) (SEE ALSO IAA)	AAI	5,000	5,000
Amyl alcohol (n-)	AAN	5,000	5,000
Amyl alcohol (tert-)	AAI		
AMYL ALCOHOL, PRIMARY	APM	5,000	5,000
AMYL ALCOHOL, (sec-)	ASE	5,000	5,000
Amylene	AMZ		
AMYL ALCOHOL, (iso-)	IAA	5,000	5,000
Amyl Methyl Ketone	AMK		
Amyl Tallate			
Asphalt	ASP	5,000	
ASPHALT BLENDING STOCKS: Roofers flux	ARF		
ASPHALT BLENDING STOCKS: Straight run residue	ASR		
Behenyl alcohol			
Benzene Tricarboxylic acid Trioctyl Ester			
Benzyl alcohol	BAL	5,000	5,000
Bicyclic Terpenel Polyamide salt			
Brake fluid base mixtures (containing Poly(2-8)alkylene (C2-C3) glycols,	BFX		
Butane	BMX	5,000	
Butene, SEE BUTYLENE			
Butene Oligomer	BOL		
Butyl Acetate (iso-, n-)	BAX	5,000	5,000
BUTYL ACETATE (N-)	BCN	5,000	5,000
Butyl Acetate (sec-)	BTA	5,000	5,000
Butyl alcohol (iso-, n-, sec-, tert-)			5,000
BUTYL ALCOHOL (ISO-)	IAL	5,000	5,000
BUTYL ALCOHOL (N-)	BAN	5,000	5,000
BUTYL ALCOHOL (SEC-)	BAS	5,000	5,000
BUTYL ALCOHOL (TERT-)	BAT	5,000	5,000
Butyl Benzyl Phthalate	BPH	5,000	5,000
Butylene	BTN		
Butylene Glycol	BUG		
1,3-Butylene Glycol, SEE BUTYLENE GLYCOL			
Butylene Polyglycol, SEE BUTYLENE GLYCOL			
iso-Butyl Formate			
n-Butyl Formate			
Butyl Heptyl Ketone	BHK		
Butyl Methyl Ketone, SEE METHYL BUTYL KETONE			
Butyl Stearate			
Butyl Toluene	BOE	5,000	5,000

SUMMARY COMPARISON OF "SPILL VALVE" vs "P/V" MAX LIQUID TRANSFER RATES
 BARGE: C9706: CONOCO, INC.; E344

CARGO	C H R I S	MAX LIQUID TRANSFER RATE PER SPILL VALVE (BBL/ HR)	MAX LIQUID TRANSFER RATE PER P/V VALVE (BBL/ HR)
Butyrolactone (gamma)	BLA		
Calcium Alkylphenate			
Calcium Alkyl Salicylate			
Calcium Amino Nonyl Phenolate			
Calcium Carboxylate			
Caprolactam solutions	CLS	5,000	5,000
Carbon black base		5,000	
Cetyl alcohol (HEXADECANOL) SEE ALCOHOLS (C13 AND ABOVE)			
Cetyl-Stearal alcohol			
Cleaning spirit (unleaded)			
Coal tar	COR	5,000	
Cumene	CUM	5,000	5,000
Cycloaliphatic resins			
Cyclohexane	CHK	5,000	5,000
Cyclohexanol	CHN	5,000	5,000
1,3-Cyclopentadiene dimer (molten)	CPD	5,000	5,000
Cyclopentadiene polymers, SEE 1,3-CYCLOPENTADIENE DIMER (MOLTEN)			
Cymene (para-)	CMP	5,000	5,000
Decahydronaphthalene	DHN	5,000	5,000
Decaldehyde (iso-)	IDA	5,000	5,000
Decaldehyde (n-)	DAL	5,000	
Decane	DDC		
Decene	DCE	5,000	5,000
Decyl alcohol (all isomers) (DECANOL)	DAX	5,000	5,000
DECYL ALCOHOL (iso-)	ISA	5,000	5,000
DECYL ALCOHOL (n-)	DAN	5,000	5,000
Decylbenzene (n-)	DBZ	5,000	5,000
Detergent Alkylate			
Diacetone alcohol	DAA	5,000	5,000
Dialkyl (C10-C14) Benzenes	DAB		
Dialkyl (C7-C13) Phthalates	DAH		
Dibutyl Carbinol			
Dibutyl Phthalate (ortho-)	DPA	5,000	
Dicyclopentadiene, SEE 1,3-CYCLOPENTADIENE DIMER (MOLTEN)	DPT	5,000	5,000
Diethylbenzene	DEB	5,000	5,000
Diethylene Glycol	DEG	5,000	5,000
Diethylene Glycol Butyl Ether	DME	5,000	5,000
Diethylene Glycol Butyl Ether Acetate	DEM		
Diethylene Glycol Dibutyl Ether	DIG		
Diethylene Glycol Diethyl Ether			
Diethylene Glycol Ethyl Ether	DGE		
Diethylene Glycol Ethyl Ether Acetate	DGA	5,000	5,000
Diethylene Glycol Methyl Ether	DGM	5,000	5,000
Diethylene Glycol Methyl Ether Acetate	DGR		
Diethylene Glycol Phenyl Ether	DGP		
Diethylene Glycol Phthalate	DGL		
Di-(2-ethylhexyl)adipate	DEH		
Di-(2-ethylhexyl)phthalate	DIE		
Diethyl Phthalate	DPH		
Diglycidyl Ether of Bisphenol A	BDE		
Diheptyl Phthalate	DHP		
Dihexyl Phthalate	DHA		
Diisobutylcarbinol	DBC	5,000	5,000
Diisobutylene	DBL	5,000	5,000
Diisobutyl Ketone	DIK	5,000	5,000
Diisobutyl Phthalate	DIT		
Diisodecyl Phthalate	DID		
Diisononyl Adipate	DNY		
Diisononyl Phthalate	DIN		
Diisooctyl Phthalate	DIO		
Diisopropylbenzene (all isomers)	DIX	5,000	5,000

SUMMARY COMPARISON OF "SPILL VALVE" vs "P/V" MAX LIQUID TRANSFER RATES
 BARGE: C9706: CONOCO, INC.; E344

CARGO	C H R I S	MAX LIQUID TRANSFER RATE PER SPILL VALVE (BBL/ HR)	MAX LIQUID TRANSFER RATE PER P/V VALVE (BBL/ HR)
-----	***	-----	-----
Diisopropyl Naphthalene	DII		
Dimethyl Adipate	DLA		
Dimethylbenzene			
Dimethyl Glutarate	DGT		
Dimethyl Phthalate	DTL	5,000	
Dimethyl Polysiloxane	DMP		
2,2-Dimethylpropane-1,3-diol	DDI		
Dimethyl Succinate	DSE		
Dinonyl Phthalate	DIF	5,000	5,000
Di(octylphenyl)amine			
Diocetyl Phthalate	DOP	5,000	
Dipentene	DPN	5,000	5,000
Diphenyl	DIL	5,000	5,000
Diphenyl, Diphenyl Ether mixture	DDO	5,000	5,000
Diphenyl Ether	DPE	5,000	5,000
Diphenyl Ether, Biphenyl Ether mixture	DOB		
Dipropylene Glycol	DPG	5,000	5,000
Dipropylene Glycol Dibenzoate	DGY		
Dipropylene Glycol Methyl Ether	DPY		
DISTILLATES: Flashed feed stocks	DFF	5,000	5,000
DISTILLATES: Straight run	DSR	5,000	5,000
Ditridecyl Phthalate	DTP		
Diundecyl Phthalate	DUP		
Dodecane (all isomers)	DOC		
Dodecanol	DDN		
Dodecene (all isomers)	DOZ	5,000	5,000
DODECENE	DOD	5,000	5,000
Dodecylbenzene	DDB	5,000	5,000
Dodecyl Phenol	DOL		
Drilling mud (low toxicity) (if flammable or combustible)/			
Epoxylated linear alcohols, C11-C15			
Ethane	ETH	5,000	
2-Ethoxyethanol	EEO	5,000	
2-Ethoxyethyl Acetate	EEA	5,000	
Ethoxylated alcohols, C11-C15, SEE THE ALCOHOL POLYETHOXYLATES			
Ethoxy Triglycol (crude)	ETG	5,000	
Ethyl Acetate	ETA	5,000	5,000
Ethyl Acetoacetate	EAA	5,000	5,000
Ethyl alcohol (ETHANOL)	EAL	5,000	5,000
Ethyl Amyl Ketone	EAK		
Ethyl Benzene	ETB	5,000	5,000
Ethyl Butanol	EBT	5,000	5,000
Ethyl Butyrate	EBR	5,000	5,000
Ethyl Cyclohexane	ECY	5,000	5,000
Ethylene	ETL		
Ethylene Carbonate			
Ethylene Glycol	EGL	5,000	5,000
Ethylene Glycol Acetate	EGO		
Ethylene Glycol Butyl Ether	EGM		
ETHYLENE GLYCOL BUTYL ETHER ACETATE	EMA	5,000	5,000
Ethylene Glycol Ether Acetate			
Ethylene Glycol Tert-Butyl Ether			
Ethylene Glycol Diacetate	EGY	5,000	5,000
Ethylene Glycol Dibutyl Ether	EGB		
Ethylene Glycol Ethyl Ether, SEE 2-ETHOXYETHANOL	EGP		
Ethylene Glycol Ethyl Ether Acetate, SEE 2-ETHOXYETHYL ACETATE	EGA		
Ethylene Glycol Isopropyl Ether	BGI		
Ethylene Glycol Methyl Butyl Ether			
Ethylene Glycol Methyl Ether	EME	5,000	5,000
Ethylene Glycol Methyl Ether Acetate	EGT		
Ethylene Glycol Phenyl Ether	EPE	5,000	5,000

SUMMARY COMPARISON OF "SPILL VALVE" vs "P/V" MAX LIQUID TRANSFER RATES
 BARGE: C9706: CONOCO, INC.; E344

CARGO	C H R I S	MAX LIQUID TRANSFER RATE PER SPILL VALVE (BBL/ HR)	MAX LIQUID TRANSFER RATE PER P/V VALVE (BBL/ HR)
----- *** -----			
Ethylene Glycol Phenyl Ether, Diethylene Glycol Phenyl Ether mixture	EDX		
Ethylene-Propylene Copolymer (in liquid mixtures)	EEP		
Ethyl-3-Ethoxypropionate	ENA	5,000	5,000
2-Ethylhexaldehyde, SEE OCTYL ALDEHYDES	EHO		
2-Ethylhexanoic acid	EHK	5,000	5,000
2-Ethylhexanol, SEE OCTANOL (ALL ISOMERS)			
Ethylhexoic acid, SEE 2-ETHYLHEXANOIC ACID	EHE		
Ethyl Hexyl Phthalate (SEE ALSO DI 2-ETHYLHEXYL PHTHALATE)	EHT		
Ethyl Hexyl Tallate	EPR	5,000	5,000
Ethyl Propionate	ETE	5,000	5,000
Ethyl Toluene			
Fatty acid (saturated, C13 and above)			
Fatty acid Amides	FAM	5,000	5,000
Formamide	FAL	5,000	5,000
Furfuryl Alcohol	GOC		
Gas oil, cracked	GAK	5,000	5,000
GASOLINE BLENDING STOCKS: Alkylates	GRF	5,000	5,000
GASOLINE BLENDING STOCKS: Reformates	GAT	5,000	5,000
GASOLINES: Automotive (containing not over 4.23 grams lead per gallon)	AvigAV	5,000	5,000
GASOLINES: Aviation (containing not over 4.86 grams lead per gallon)	GCS	5,000	5,000
GASOLINES: Casinghead (natural)	GPL	5,000	5,000
GASOLINES: Polymer	GSR	5,000	5,000
GASOLINES: Straight run	GCR	5,000	
Glycerine			
Glycerol, SEE GLYCERINE			
Glycerol Polyalkoxylate			
Glycerol Triacetate			
Glycidyl Ester of Tertiary Carboxylic acid, SEE GLYCIDYL ESTER OF TRIDECYL A	GLT		
Glycidyl Ester of Tridecyl Acetic acid			
Glycidyl Ester of Versatic acid, SEE GLYCIDYL ESTER OF TRIDECYL ACETIC ACID			
Glycol Diacetate, SEE ETHYLENE GLYCOL DIACETATE			
Glycols, Resins and Solvents mixtures			
Gylcol Triacetate, SEE GLYCERYL TRIACETATE			
Glyoxal solution (40% or less)			
Grease			
Heptadecane	HMX	5,000	5,000
Heptane (all isomers) (METHYHEXANE)	HPT	5,000	5,000
HEPTANE (N-)	HEP	5,000	5,000
Heptanoic acid	HTX	5,000	5,000
Heptanol (all isomers)	HTN	5,000	5,000
HEPTANOL	HPX	5,000	5,000
Heptene (all isomers)	HTE	5,000	5,000
HEPTENE (1-)	HPE	5,000	5,000
Heptyl Acetate			
Herbicide (C15 -H22 -NO2 -CI), SEE METOLACHLOR			
Hexaethylene Glycol	HTS		
Hexamethylene Glycol	HXS	5,000	5,000
Hexamethylenetetramine solutions	HXA	5,000	5,000
Hexane (all isomers)	HKO	5,000	5,000
HEXANE	HKN	5,000	5,000
Hexanoic acid	HEX	5,000	5,000
Hexanol	HXE	5,000	5,000
Hexene (all isomers)	HXT	5,000	5,000
HEXENE (1-)	HAE		
HEXENE (2-)	HKG	5,000	5,000
Hexyl Acetate			
Hexylene Glycol			
Hog Grease, SEE LARD	HBA		
2-Hydroxy-4-(methylthio)butanoic acid	HPN		
HYDROCARBON 5-9 (MOVED TO SUB-O, NON TABLE 151, 6/24/95)			
Hydroxy terminated Polybutadiene, SEE POLYBUTADIENE, HYDROXYL TERMINATED/			

SUMMARY COMPARISON OF "SPILL VALVE" vs "P/V" MAX LIQUID TRANSFER RATES
 BARGE: C9706: CONOCO, INC.; E344

CARGO	C H R I S	MAX LIQUID TRANSFER RATE PER SPILL VALVE (BBL/ HR)	MAX LIQUID TRANSFER RATE PER P/V VALVE (BBL/ HR)
Isophorone	IPH	5,000	5,000
JET FUELS: JP-1 (Kerosene)	JPO	5,000	5,000
JET FUELS: JP-3	JPT	5,000	5,000
JET FUELS: JP-4	JPF	5,000	5,000
JET FUELS: JP-5 (Kerosene, heavy)	JPV	5,000	5,000
JET FUELS: JP-8	JPE		
Kerosene	KRS	5,000	5,000
Lactic acid			
Lard			
Latex, liquid synthetic, including: Styrene-Butadien rubber	LLS		
Latex, liquid synthetic, including: Carboxylated Styrene-Butadien Copolymer			
Magnesium Nonyl Phenol Sulfide			
Magnesium Sulfonate	MSE		
Maleic Anhydride Copolymer			
2-Mercaptobenzothiazol (in liquid mixtures)			
Methane	MTH		
3-Methoxy-1-Butanol			
3-Methoxybutyl Acetate	MOA		
1-Methoxy-2-Propyl Acetate	MPO		
Methoxy Triglycol, SEE TRIETHYLENE GLYCOL METHYL ETHER	MTG		
Methyl Acetate	MIT	5,000	5,000
Methyl Acetoacetate	MAE		
Methyl alcohol (SEE METHANOL)	MAL	5,000	5,000
Methyl Amyl Acetate	MAC	5,000	5,000
Methyl Amyl alcohol	MAA	5,000	5,000
Methyl Amyl Ketone	MAK		
Methyl Butanol, SEE THE AMYL ALCOHOLS			
Methyl Butenol	MBL		
Methyl n-Butyl Ketone	MBK	5,000	5,000
Methyl Butynol	MBY		
Methyl Butyrate	MBU	5,000	5,000
Methyl Ethyl Ketone	MEK	5,000	5,000
Methyl Formal (DIMETHYL FORMAL)	MTF	5,000	5,000
Methyl Heptyl Ketone	MHK	5,000	5,000
Methyl Isobutyl Carbinol, SEE METHYL AMYL ALCOHOL	MIC	5,000	
Methyl Isobutyl Ketone	MIK	5,000	5,000
3-Methyl-3-Methoxybutanol			
3-Methyl-3-Methoxybutyl Acetate			
1-Methyl Naphthalene	MNA	5,000	5,000
Methyl Pentene			
2-METHYL-1-PENTENE	MPN	5,000	5,000
5-METHYL-1-PENTENE	MTN	5,000	5,000
N-Methyl-2-Pyrrolidone	MPY		
Methyl Tert-Butyl Ether (MTBE)	MBE	5,000	5,000
Metolachlor	MCO		
Mineral spirits	MNS	5,000	5,000
Myrcene	MRE	5,000	5,000
NAPHTHA: Aromatic (Having less than 10% Benzene)			
NAPHTHA: Cracking fraction			
NAPHTHA: Heavy			
NAPHTHA: Paraffinic			
NAPHTHA: Petroleum	PTN		
NAPHTHA: Solvent	NSV	5,000	5,000
NAPHTHA: Stoddard solvent	NSS	5,000	5,000
NAPHTHA: Varnish makers' and painters' (75%)	NVM	5,000	5,000
Naphthalene Sulfonic acid-Formaldehyde Copolymer, Sodium salt solution	NFS		
Naphthenic acid	NTI	5,000	
Nonane (all isomers)	NAX		5,000
NONANE	NAN	5,000	5,000
Nonanoic acid (all isomers)	NNA		
Nonanoic, Tridecanoic acid mixture			

SUMMARY COMPARISON OF "SPILL VALVE" vs "P/V" MAX LIQUID TRANSFER RATES
 BARGE: C9706: CONOCO, INC.; E344

CARGO	C H R I S	MAX LIQUID TRANSFER RATE PER SPILL VALVE (BBL/ HR)	MAX LIQUID TRANSFER RATE PER P/V VALVE (BBL/ HR)
Nonene	NON	5,000	5,000
Nonyl alcohol (all isomers)	NNS	5,000	5,000
NONYL ALCOHOL	NNN	5,000	5,000
NONYL ALCOHOL (iso-)	NNI	5,000	5,000
Nonyl Methacrylate Monomer			
Nonyl Phenol	NNP	5,000	5,000
Nonyl Phenol Poly(4-12)ethoxylates	NPE		
Nonyl Phenol Sulfide (90% or less)			
Noxious liquid, N.O.S. (17) ("Trade name," contains "principal components"),			
Non-Noxious liquid, N.O.S. (18) ("Trade name," contains principal components)			
Octadecene	ODD		
Octadecenoamide solution (Oleamide)	OAX	5,000	5,000
Octane (all isomers)	OAN	5,000	5,000
OCTANE	OAA	5,000	5,000
Octanoic acid (all isomers)	OCK	5,000	5,000
Octanol (all isomers)	OTA	5,000	5,000
OCTANOL	OTX	5,000	5,000
Octene (all isomers)	OTE	5,000	5,000
OCTENE (1-)			
Octyl Acetate			
Octyl alcohol (iso-, n-) (all isomers), SEE OCTANOL (ALL ISOMERS)	OCK	5,000	5,000
OCTYL ALCOHOL	IQA	5,000	5,000
Octyl Aldehydes	OAL		
Octyl Decyl Adipate	ODA		
Octyl Epoxytallate	OET		
Octyl Phthalate. SEE DI-(2-ETHYLHEXYL) PHTHALATE			
OIL, EDIBLE: Babassu	OBBS		
OIL, EDIBLE: Beechnut			
OIL, EDIBLE: Castor	OCA		
OIL, EDIBLE: Cocoa butter			
OIL, EDIBLE: Coconut	OCC	5,000	
OIL, EDIBLE: Cod liver			
OIL, EDIBLE: Corn	OCO	5,000	
OIL, EDIBLE: Cottonseed	OCS		
OIL, EDIBLE: Fish, N.O.S.	OFS	5,000	
OIL, EDIBLE: Grapeseed			
OIL, EDIBLE: Groundnut			
OIL, EDIBLE: Hazelnut			
OIL, EDIBLE: Lard	OLD		
OIL, EDIBLE: Maize			
OIL, EDIBLE: Mustard seed			
OIL, EDIBLE: Nutmeg Butter			
OIL, EDIBLE: Olive	OOL		
OIL, EDIBLE: Palm	OPM		
OIL, EDIBLE: Palm kernel	OPO		
OIL, EDIBLE: Peanut	OPN		
OIL, EDIBLE: Poppy			
OIL, EDIBLE: Raisin seed			
OIL, EDIBLE: Rice bran	ORP		
OIL, EDIBLE: Safflower	OSF		
OIL, EDIBLE: Salad			
OIL, EDIBLE: Sesame			
OIL, EDIBLE: Soya bean	OSB	5,000	
OIL, EDIBLE: Sunflower, SEE SUNFLOWER SEED		5,000	
OIL, EDIBLE: Sunflower seed	OSN		
OIL, EDIBLE: Tucum	OTC		
OIL, EDIBLE: Vegetable, N.O.S.	OVG	5,000	
OIL, EDIBLE: Walnut			
OIL, FUEL: No. 1 (Kerosene)	OON		
OIL, FUEL: No. 1-D	OOD		
OIL, FUEL: No. 2	OTW	5,000	5,000

SUMMARY COMPARISON OF "SPILL VALVE" vs "P/V" MAX LIQUID TRANSFER RATES
 BARGE: C9706: CONOCO, INC.; E344

CARGO	C H R I S	MAX LIQUID TRANSFER RATE PER SPILL VALVE (BBL/ HR)	MAX LIQUID TRANSFER RATE PER P/V VALVE (BBL/ HR)

OIL, FUEL: No. 2-D	OTD		
OIL, FUEL: No. 4	OFR	5,000	5,000
OIL, FUEL: No. 5	OFV	5,000	5,000
OIL, FUEL: No. 6	OSX	5,000	5,000
OIL, MISC: Absorption	OAS		
OIL, MISC: Aliphatic			
OIL, MISC: Animal, N.O.S.			
OIL, MISC: Aromatic			
OIL, MISC: Aviation F2300	OCF		
OIL, MISC: Clarified			
OIL, MISC: Coal			
OIL, MISC: Coconut oil, esterified, SEE COCONUT OIL, FATTY ACID METHYL ESTER			
OIL, MISC: Coconut oil, fatty acid			
OIL, MISC: Coconut oil, fatty acid Methyl Ester	OCM		
OIL, MISC: Coconut oil, Methyl Ester, SEE COCONUT OIL FATTY ACID METHYL ESTER	CFY	5,000	
OIL, MISC: Cottonseed, fatty acid, SEE COTTONSEED OIL, FATTY ACID			
OIL, MISC: Croton	OIL	5,000	5,000
OIL, MISC: Crude	ODS	5,000	5,000
OIL, MISC: Diesel			
OIL, MISC: Gas, low pour			
OIL, MISC: Gas, low sulfur			
OIL, MISC: Heartcut distillate			
OIL, MISC: Lanolin			
OIL, MISC: Linseed	OLB	5,000	5,000
OIL, MISC: Lubricating			
OIL, MISC: Mineral	OMS		
OIL, MISC: Mineral seal	OMT		
OIL, MISC: Motor	ONF		
OIL, MISC: Neatsfoot	OOI		
OIL, MISC: Oiticica	OPE	5,000	
OIL, MISC: Palm oil, fatty acid Methyl Ester	EOPE		
OIL, MISC: Palm oil, Methyl Ester, SEE SEE PALM OIL, FATTY ACID METHYL	OPT		
OIL, MISC: Penetrating			
OIL, MISC: Perilla			
OIL, MISC: Pilchard	OPI		
OIL, MISC: Pine	ORG		
OIL, MISC: Range			
OIL, MISC: Residual	ORS	5,000	5,000
OIL, MISC: Resin			
OIL, MISC: Resinous petroleum	ORD		
OIL, MISC: Road	ORN		
OIL, MISC: Rosin			
OIL, MISC: Seal	OIS		
OIL, MISC: Soapstock			
OIL, MISC: Soya bean (epoxidized)	OSP		
OIL, MISC: Sperm	OSD		
OIL, MISC: Spindle	OSY		
OIL, MISC: Spray	OTL		
OIL, MISC: Tall	TOP		
OIL, MISC: Tall, fatty acid	OTN		
OIL, MISC: Tanner's	OTF		
OIL, MISC: Transformer	OTG		
OIL, MISC: Tung	OTB	5,000	5,000
OIL, MISC: Turbine			
OIL, MISC: Whale			
OIL, MISC: White (mineral)			
OIL, MISC: Wood	OAM		
alpha-Olefins (C13 - C18)		5,000	
Olefins (C13 and above, all isomers)	OLA		
Oleic acid			
Oleyl alcohol (OCTADECENOL), SEE ALCOHOLS (C13 AND ABOVE)			

SUMMARY COMPARISON OF "SPILL VALVE" vs "P/V" MAX LIQUID TRANSFER RATES
 BARGE: C9706: CONOCO, INC.; E344

CARGO	C H R I S	MAX LIQUID TRANSFER RATE PER SPILL VALVE (BBL/ HR)	MAX LIQUID TRANSFER RATE PER P/V VALVE (BBL/ HR)
Organic Amine 70, SEE AMINOETHYLDIETHANOLAMINE, AMINOETHYL-ETHANOLAMINE	SOLU		
Palm Stearin	PMS		
n-Paraffins (C10 - C20)	PFN		
Pentadecanol, SEE SEE ALCOHOLS (C13 AND ABOVE)	PDC	5,000	5,000
Pentaethylene Glycol	PEP		
Pentaethylenhexamine	PTY	5,000	5,000
Pentane (all isomers)	IPT	5,000	5,000
PENTANE (iso-)	PTA	5,000	5,000
PENTANE (n-)			
Pentanoic acid	PTX	5,000	5,000
Pentene (all isomers)	PTE	5,000	5,000
PENTENE (1-)	PTL		
Petrolatum	PXE		
1-Phenyl-1-Xylol Ethane			
Phosphosulfurized Bicyclic Terpene			
Phthalate plasticizers, SEE INDIVIDUAL PHTHALATES	PIN	5,000	5,000
Pinene			
Polyalkenyl Succinic Anhydride Amine	PPX		
Polyalkylene Glycols, Polyalkylene Glycol Monoalkyl Ethers mixtures	PAO	5,000	
Polyalkylene Oxide Polyol			
Polamine, Amide mixture			
Polybutadiene, Hydroxyl terminated	PLB	5,000	5,000
Polybutene		5,000	
Polydimethylsiloxane		5,000	
Polyethylene Glycol			
Polyethylene Glycol Dimethyl Ether			
Polyglycerol			
Polyisobutylene, SEE POLYBUTENE			
Polymerized Esters	PSM		
Poly(20)oxyethylene Sorbitan Monooleate	PLP		
Polypropylene	PGC	5,000	5,000
Polypropylene Glycol	PGM	5,000	5,000
Polypropylene Glycol Methyl Ether			
Polysiloxane			
Polystyrene Diakyl Maleate	POE		
Potassium Oleate	PRP	5,000	
Propane	FXP		
n-Propoxypropanol	IAC	5,000	5,000
Propyl Acetate (iso-)	PAT		5,000
Propyl Acetate (n-)	IPA	5,000	5,000
Propyl alcohol (iso-)	PAL	5,000	5,000
Propyl alcohol (n-)	PBZ	5,000	5,000
Propylbenzene (n-)	IPX	5,000	5,000
iso-Propylcyclohexane	PPL	5,000	
Propylene	PBP		
Propylene-Butylene Copolymer	PDR		
Propylene Dimer	PPG	5,000	5,000
Propylene Glycol (1,2-PROPANDIOL)	PGE		
Propylene Glycol Monoalkyl Ether	PGY		
Propylene Glycol Ethyl Ether	PME	5,000	5,000
Propylene Glycol Methyl Ether			
Propylene Polymer (in liquid mixtures)	PTT	5,000	5,000
Propylene Tetramer	PTR		
Propylene Trimer			
Pseudocumene, SEE TRIMETHYLBENZENES			
Rum			
Sodium Acetate, Glycol, water solutions	SAN		
Sodium Acetate solution	SEN		
Sodium Benzoate solution			
Sodium Sulfonate	SRA		
Stearic acid			

SUMMARY COMPARISON OF "SPILL VALVE" vs "P/V" MAX LIQUID TRANSFER RATES
 BARGE: C9706: CONOCO, INC.; E344

CARGO	C H R I S	MAX LIQUID TRANSFER RATE PER SPILL VALVE (BBL/ HR)	MAX LIQUID TRANSFER RATE PER P/V VALVE (BBL/ HR)
Stearyl alcohol (Octadecanol)	SFL	5,000	5,000
Sulfolane	TLO		
Tallow	TFD		
Tallow alcohol, SEE ALCOHOLS (C13 AND ABOVE)			
Tallow fatty acid			
Tallow Alkyl Nitrile	TTN	5,000	
Tetradecanol	TTD	5,000	5,000
1-Tetradecene, SEE THE OLEFIN OR ALPHA-OLEFIN ENTRIES	TBD		
Tetradecylbenzene	TTG	5,000	5,000
Tetraethylene Glycol	THN	5,000	5,000
Tetrahydronaphthalene			
Tetrapropylbenzene, SEE ALKYL (C9-C17) BENZENES	TOL	5,000	5,000
Toluene			
Triaryphosphate	TBP		
Tributyl Phosphate	TCP	5,000	5,000
Tricresyl Phosphate (less than 1% of the ortho isomer)	TRD	5,000	5,000
Tridecane			
Tridecanoic acid	TDN	5,000	5,000
Tridecanol, SEE ALCOHOLS (C13 AND ABOVE)	TDC	5,000	5,000
1-Tridecene	TRB		
Tridecylbenzene	TEB	5,000	5,000
Triethylbenzene	TEG	5,000	5,000
Triethylene Glycol			
Triethylene Glycol Butyl Ether		5,000	
Triethylene Glycol Butyl Ether mixture	TGD		
Triethylene Glycol di-(2-ethylbutyrate)			
Triethylene Glycol Ether mixture	TGE		
Triethylene Glycol Ethyl Ether			
Triethylene Glycol Methyl Ether	TPS	5,000	5,000
Triethyl Phosphate			
Triisooctyl Trimellitate	TIP	5,000	
Triisopropanolamine	TRE	5,000	5,000
Trimethylbenzenes (all isomers)	TMB	5,000	5,000
TRIMETHYL BENZENE (1,2,5-)	TMD	5,000	5,000
TRIMETHYL BENZENE (1,2,3-)	TME	5,000	5,000
TRIMETHYL BENZENE (1,2,4-) (PSEUDOCUMENE)	TPR		
Trimethylol Propane Polyethoxylate			
2,2,4-Trimethyl pentanediol-1,3-diisobutyrate	TMP		
2,2,4-Trimethyl-3-pentanol-1-isobutyrate			
Tripropylene, SEE PROPYLENE TRIMER	TGC		
Tripropylene Glycol	TGM		
Tripropylene Glycol Methyl Ether	TRP	5,000	
Trixylenyl Phosphate	TPT		
Turpentine			
Turpentine substitute (White spirit), SEE WHITE SPIRIT (LOW (15-20%) AROMATI			
Undecanol	UDC	5,000	5,000
Undecene (1-)	UND	5,000	5,000
Undecyl alcohol	UDB		
Undecylbenzene			
Vinyl Acetate-fumerate Copolymer	WAX		
Waxes:			
WAXES: Candelilla	WAX,		
WAXES: Carnauba	WAX,		
WAXES: Paraffin			
WAXES: Petroleum			
White spirit, SEE WHITE SPIRIT (LOW (15-20%) AROMATIC)	WSL		
White spirit (low (15 - 20%) aromatic)			
Wine, SEE ALCOHOLIC BEVERAGES, N.O.S.			
Wool grease	XLX	5,000	5,000
Xylenes (ortho-, meta-, para-)	XLM	5,000	5,000
XYLENE (M-)			

SUMMARY COMPARISON OF "SPILL VALVE" vs "P/V" MAX LIQUID TRANSFER RATES
 BARGE: C9706: CONOCO, INC.; E344

CARGO	C H R I S	MAX LIQUID TRANSFER RATE PER SPILL VALVE (BBL/ HR)	MAX LIQUID TRANSFER RATE PER P/V VALVE (BBL/ HR)
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XYLENE (O-)	XLO	5,000	5,000
XYLENE (P-)	XLP	5,000	5,000
XYLENOL	XYL	5,000	5,000
Zinc Dialkyldithiophosphate			