



DUCON TECHNOLOGIES INC.

"Serving the Industry Since 1938"

19 Engineers Lane

Farmingdale, NY 11735, USA

Tel: (631) 694-1700 Fax: (631) 420-4985

CO₂ / PROCESS SCRUBBER

INSTALLATION

OPERATION

&

MAINTENANCE

CC018
CIE: ETHANOL
Canton, Illinois

05.23.07

File: 17.1 TW-3501

TW-3502
ME-3503

0180017015

DESIGN DATA:

ITEM 1:

CO₂ PACKED TOWER SCRUBBER

SCRUBBER TYPE: CAT

UNIT SIZE: 42

NO. OF UNITS REQUIRED: ONE (1)

APPLICATION: ETHANOL REMOVAL FROM CO₂ GAS STREAM

INLET GAS VOLUME: 4,915 ACFM

INLET ETHANOL CONTENT: 259.9 LBS/HR IN 28,625 LB/HR CO₂ + 456 LB/HR
N₂ + 130 LB/HR O₂

INLET METHANOL CONTENT: 0.659 LB/HR

INLET CH₃COH CONTENT: 0.975 LB/HR

INLET MOISTURE CONTENT: 999 LB/HR

GAS TEMPERATURE: 90-93° F.

SCRUBBER LIQUID:

WATER RATE: 72 GPM @ 70°F AT 20 PSI

CLEAN WATER SPRAY FOR DEMISTER: 10 GPM AT 25 PSI

SCRUBBER:

MATERIAL: FRP, ASHLAND HETRON 992

SCRUBBER DIAMETER: 3'-6"

PACKING:

PACKING: 4" Q-PAC, 15' - 0" HIGH, 150 CU-FT

MATERIAL: POLYPROPYLENE

MIST ELIMINATOR:

TYPE: MESH PAD

MATERIAL: POLYPROPYLENE

REFERENCE DRAWINGS:

DRAWING NO: DC06-4956 - 01, REV. 7

ITEM 2:

PROCESS PACKED TOWER SCRUBBER

SCRUBBER TYPE: CAT

UNIT SIZE: 30

NO. OF UNITS REQUIRED: ONE (1)

APPLICATION: ETHANOL REMOVAL FROM CO2 GAS STREAM

INLET GAS VOLUME: 1,001 ACFM

INLET ETHANOL CONTENT: 12 LBS/HR IN 1,335 LB/HR CO2 + 1557 LB/HR N2 +
348 LB/HR O2

INLET METHANOL CONTENT: 3.12 LB/HR

INLET CH3COH CONTENT: 2.48 LB/HR

INLET FORMALDEHYDE CONTENT: 2.42 LB/HR

INLET MOISTURE CONTENT: 933 LB/HR

GAS TEMPERATURE: 141° F.

SCRUBBER LIQUID:

WATER RATE: 50 GPM @ 70°F MAX. AT 20 PSI

CLEAN WATER SPRAY FOR DEMISTER: 5 GPM AT 25 PSI

SCRUBBER:

MATERIAL: FRP, ASHLAND HETRON 992

SCRUBBER DIAMETER: 2'-6"

PACKING:

PACKING: 4" Q-PAC, 15' - 0" HIGH, 75 CU-FT

MATERIAL: POLYPROPYLENE

MIST ELIMINATOR:

TYPE: MESH PAD

MATERIAL: POLYPROPYLENE

REFERENCE DRAWINGS:

DRAWING NO: DC06-4956 - 02, REV. 5

ITEM 3:

EXHAUST STACK W/ PLATFORM AND LADDER

STACK SIZE: 70' OVERALL HEIGHT. DIAMETER 30" AT LOWER 45'-0" AND
20" AT TOP 25'-0"

NO. OF UNITS REQUIRED: ONE (1)

MATERIAL: SS 304

REFERENCE DRAWINGS:

DRAWING NO: D06-88-S1-4

PERFORMANCE GUARANTEE:

1. O₂ SCRUBBER:

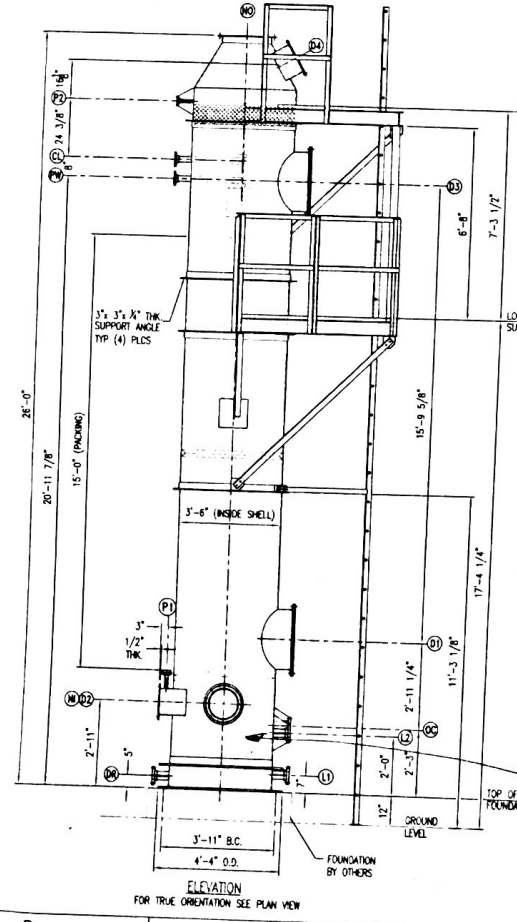
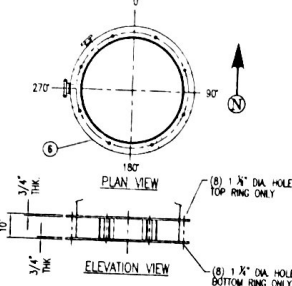
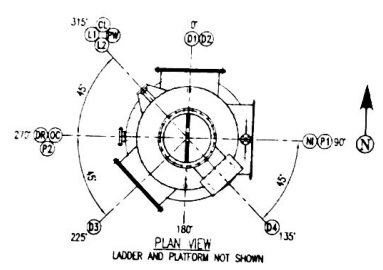
Under the specified operating condition of CO₂ scrubber, the scrubber will remove more than 99.9% of alcohols, greater than 30% of the acetaldehyde and all of the formaldehyde.

2. PROCESS SCRUBBER:

Under the specified operating condition of Process scrubber, the scrubber will remove more than 99.9% of alcohols and greater than 45% of the acetaldehyde.

3. FOR COMBINED TWO SCRUBBERS:

Under the specified operating condition of both scrubbers for combined effluent, the exhausting VOC from two scrubbers will be less than 2.5 LB/HR.



NOZZLE SCHEDULE

ITEM	REQ'D	INCHES	SERVICE	FLANGE DRILLING CONNECTION TYPE	PROJECTION	POSITION
N.O.	1	20" ROUND	OUTLET	FRP PLATE FLANGE	3"	VERT
N.I.	1	10" x 28"	INLET	FRP PLATE FLANGE	6"	90°
DR	1	3" DIA	DRAIN	CPVC 150# FLANGE	8"	270°
OC	1	3" DIA	OVER FLOW	CPVC 150# FLANGE	8"	270°
D-1	1	24" DIA	MANWAY	FRP FLG. W/ 1/2" CLEAR LEAN COVER	6"	0°
D-2	1	12" DIA	MANWAY	FRP FLG. W/ 1/2" CLEAR LEAN COVER	6"	0°
D-3	1	24" DIA	MANWAY	FRP FLG. W/ 1/2" CLEAR LEAN COVER	6"	225°
D-4	1	12" x 24"	MANWAY	FRP FLG. W/ 1/2" CLEAR LEAN COVER	6"	135°
PM	1	2" DIA	PACKING SPRAY WATER	CPVC 150# FLANGE	7"	315°
CL	1	2" DIA	DEMISTER CLEAN WATER	CPVC 150# FLANGE	7"	315°
P1	1	1" DIA	DFT. PRESSURE INDICATOR PORT 1	CPVC 150# FLANGE	7"	90°
P2	1	1" DIA	DFT. PRESSURE INDICATOR PORT 2	CPVC 150# FLANGE	7"	270°
L1	1	3" DIA	LEVEL	CPVC 150# FLANGE	6"	315°
L2	1	3" DIA	LEVEL	CPVC 150# FLANGE	6"	315°

BILL OF MATERIAL

ITEM	REQ'D	DESCRIPTION	REMARKS
1	1	PACKED TOWER ASSEMBLY	
2	1	PACKING 15'-0" HIGH	
3	1	PACKING SPRAY NOZZLES	REPLACEABLE
4	1	DEMISTER CLEAN NOZZLES	REPLACEABLE
5	1	DEMISTER MESHING	REPLACEABLE
6	1	TOWER SUPPORT RING	FRP
7	1	LADDER	CALVANIZED C.S.
8	1	LOWER PLATFORM	CALVANIZED C.S.
9	1	UPPER PLATFORM	CALVANIZED C.S.

CONSTRUCTION MATERIALS

1) ACCESS BETWEEN 222 PREMIUM GRADE WHITE EXTER RESIN WITH INTERNAL SLIMP AND CONE TOP UNLESS OTHERWISE NOTED. THICKNESS: SHELL 3/8", BOTTOM 5/8"
 2) PACKING: 4" O-D. POLYPROPYLENE

DESIGN DATA

INLET AIR FLOW: 4,915 ACFM
 TEMPERATURE: 82°F
 PRESSURE: ATMOSPHERIC
 INLET ETHANOL CONCENT: 258 B/W IN 20225 B/W O22 + 458 B/W IN 42
 + 130 B/W IN 42
 INLET METHANOL CONCENT: 0.658 B/W IN
 INLET CHURCH CONCENT: 0.975 B/W IN
 INLET GAS: 1000 B/W IN O22 + 1024 B/W
 INLET MOISTURE CONCENT: 75 GRAMS PER
 DEMISTER SPRAY: 10 GRAMS PER

LOADING TABLE

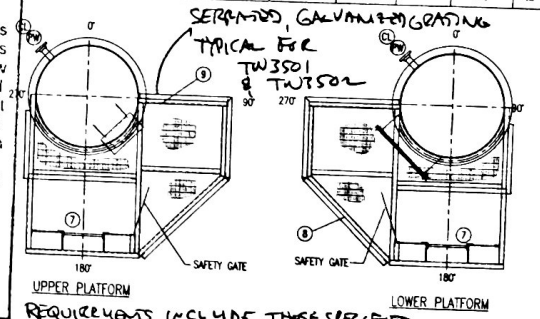
LOAD DIRECTION: + ↓ - ↑

LOAD	SCRUBBER FILLED W/ WATER		SCRUBBER FILLED W/ O WATER		SCRUBBER W/ O WATER	
	SUPPORT 1-4	SUPPORT 5-8	SUPPORT 1-4	SUPPORT 5-8	SUPPORT 1-4	SUPPORT 5-8
DEAD (LBS)	2029	—	2029	—	185	—
WIND (LBS)	±1080	152	±1080	152	±70	10
SEISMIC (LBS)	±710	101	±710	101	±70	10
WIND (LBS)	875	—	420	—	875	—
WIND (LBS)	4674	253	4219	253	2180	182

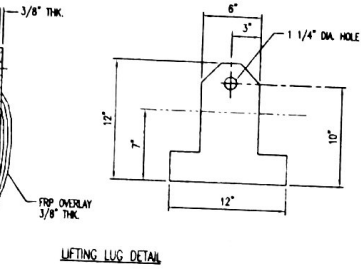
FURNISH AS SUGGESTED OR REVISE AND RESUBMIT IF REJECTED
 DIMENSIONS CORRECTED
 SUBMIT SHIPPED

Connections or comments made on the shop drawings during this check do not relieve supplier from compliance with requirements of the drawings and specifications. This check is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The supplier is responsible for: Confirming and coordinating all quantities, dimensions; selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades; and performing his work in a safe and satisfactory manner.

Lurgi, INC.
 MEMPHIS, TN
 Date 4/19/07
 Wm. Schreyer



REQUIREMENTS INCLUDE THOSE SPECIFIED BY ATTACHED EMAIL COPIES FROM 4/5/07 and 4/10/07 and 4/10/07 letter,
 06018
 CIE: ETHANOL
 Canton, Illinois
 04.10.07
 File: 17.1 TW3501
 0180017001



FIELD FILE

REV	BY	DESCRIPTION	DATE ISSUED
4	EA	REMOVED SPOILING COVER FOR CPVC	04/26/07
3	EA	REVISED LADDER AND PLATFORM LOCATIONS	04/23/07
2	EA	REVISED PER CUSTOMER COMMENTS	04/19/07
1	EA	REVISED PER CUSTOMER COMMENTS	04/10/07

SCALE: N.T.S.

PROJECT NAME: CENTRAL ILLINOIS ENERGY CANTON ILLINOIS
 TITLE: GENERAL ARRANGEMENT DUCON PACKED TOWER SIZE: 42
 DRAWING NO: DC07-4956-1-01

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