

CHILLER #1

YORK INTERNATIONAL CORP. APPLIED SYSTEMS ENGINEERING  
P.O. BOX 1592-191A YORK, PA. 17405-1592  
TELEPHONE: 717/771-7127 FAX: 717/771-7297

DATE: October 18, 1994

SUBJECT: YPC Factory Test Report

FROM: Jay Kohler - 191A



TO: Distribution Below

cc (cover sheet only):

Attached are copies of the factory test report for  
93-211038-01  
~~8094-211016-01~~ E. I. DuPont Nemours Experimental Station

This information is required for unit startup and service. A copy should be kept on-site with the unit.

Distribution:

- 1. York PA Service (1 copy) Joe Brillhart 36BE
- 2. Field Sales (2 copies) \_\_\_\_\_  
Building Systems & Services, Inc.  
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**YOR. INTERNATIONAL CORPORATION  
APPLIED SYSTEMS PERFORMANCE TEST**

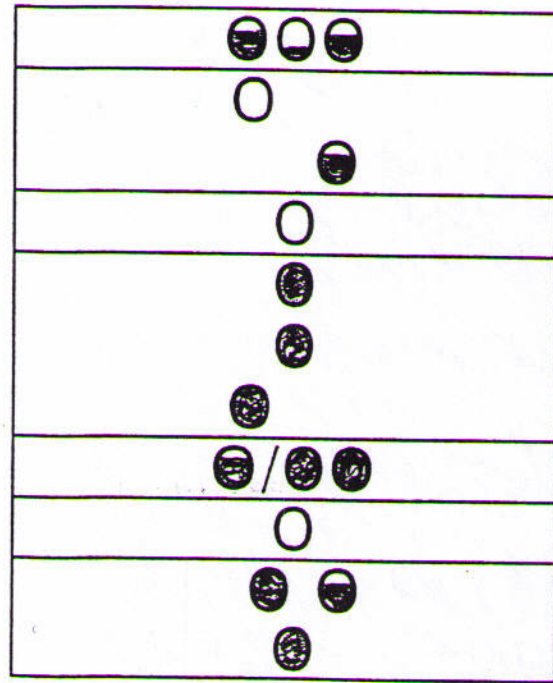
*CHILLER # 96  
# 1*

10/6/94

JOB NAME - DUPONT  
 YORK ORDER - 93-211,038-01  
 UNIT MODEL - YCP-ST-22G-46-C-X~~100~~  
 SERIAL NO. - YKBM0328T9  
*GLCM 157836*

**SIGHT GLASSES**

ABSORBER SHELL  
 ABSORBER TANK  
 EVAPORATOR  
 REFRIGERANT TANK  
 HI TEMP. GENERATOR -FRONT/REAR  
 LOW TEMP. GENERATOR  
 ALCOHOL SEPARATOR



**PROGRAMMED SETTINGS**

LEAVING CHILLED WATER TEMPERATURE	44 DEG. F
CONDENSER ENTERING WATER TEMP. LIMIT	86 DEG. F
MAXIMUM STEAM VALVE OPENING	100%
TIME DELAY BETWEEN 2 SPRAY SOLUTION PUMPS	DEFAULT SETTING

York International Corporation, York, PA  
Applied Systems Performance Test

JOB NAME: DUPONT  
YORK ORDER: 93-211,038-01  
UNIT MODEL: YPC-ST-22G-46-C ~~XXXX~~  
SERIAL NUMBER: ~~YKEM022819~~  
 GLCM 157836

Date: 10/05/94  
Time: 10:45

OPERATING CONDITIONS:

Test  
Actual

Evaporator:

Capacity (TR)	1474.0	
Flow (GPM)	2984.3	
Entering Temp (degF)	57.13	
Leaving Temp (degF)	45.29	
Range (degF)	11.84	
Pressure Drop (ft WC)	42.4	18.35 PSID
Fouling Factor	.00025	
Liquid Type	WATER	
Pass Arrangement	2 PASS	

Absorber/Condenser:

Flow (GPM)	4487.5	
Entering Temp (degF)	83.48	
Leaving Temp (degF)	98.65	
Range (degF)	15.17	
Pressure Drop (ft WC)	30.4	13.16 PSID
Fouling Factor	.00025	
Liquid Type	WATER	
Pass Arrangement	1 PASS	

57.13  
45.29  
11.84

Design  
120 GPM

York International Corporation, York, PA  
Applied Systems Performance Test

JOB NAME: DUPONT  
YORK ORDER: 93-211,038-01  
UNIT MODEL: YPC-ST-226-46-C-X~~44~~  
SERIAL NUMBER: YKBM032019  
 GLLM 157836

Date: 10/05/94  
Time: 10:45

ENERGY INPUT:

Test  
Actual

Steam:

Temperature (degF)	348.3
Pressure (psig)	114.9
Flow (as Tested) (lb/hr)	15021.5
Flow (Insulated) (lb/hr)	14443.7
Condensate temperature (degF)	180.2
Condensate pressure (psig)	20.0

347°  
290° 1st

Voltage	480.0
	482.0
	480.0

Current	37.8
	37.7
	40.0

Power (KW)	16.2
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Calc Energy In (as Tested) - cooling mode (MBH) 15700.8  
 Calc Energy In (Insulated) - cooling mode (MBH) 15096.9

PERFORMANCE RESULTS - COOLING MODE:

$$\frac{\text{Actual Capacity}}{\text{Design Capacity}} \times 100\% = 98.3\%$$

$$\text{Heat Balance Closure} = \frac{(\text{Q}_{\text{evap}} + \text{Q}_{\text{input}} - \text{Q}_{\text{cond}})}{\text{Q}_{\text{cond}}} \times 100\% = -1.6\%$$

York International Corporation, York, PA  
Applied Systems Performance Test

JOB NAME: DUPONT  
YORK ORDER: 93-211,038-01  
UNIT MODEL: YPC-ST-226-46-C-X448  
SERIAL NUMBER: ~~YKBM032819~~  
GLCM 157836

Date: 10/05/94  
Time: 10:45

Barometric Pressure: 14.55  
Ambient Temperature: 66.5

COMMENTS: Absorber/Condenser water flow is less than specified flow due to test facility limitations. Water temperatures were adjusted to compensate for flow reduction. Condenser bypass pipe was replaced by a blankoff plate during testing.

DATA REVIEWED AND VERIFIED:

*[Signature]* 10/5/94

Resident Engineer

York International Corporation, York, PA  
Applied Systems Performance Test

Level 2 Startup Information

JOB NAME: DUPONT  
YORK ORDER: 93-211,038-01  
UNIT MODEL: YPC-ST-22G-46-C-X~~44~~  
SERIAL NUMBER: YKBM032019  
GLCM 157836

Date: 10/05/94  
Time: 10:45

CYCLE CONDITIONS - COOLING:

Test  
Actual

First Stage Generator:

Pressure (psia)  
Solution Leaving Temp (degF)

12.9  
317.4

667 mmHgA 2  
030

Second Stage Generator:

Solution Entering Temp (degF)  
Solution Leaving Temp (degF)

172.5  
198.4

Absorber:

Solution Concentration (%)  
Solution Leaving Temp (degF)

57.7  
97.2

100 - 020  
 132 - 020  
 132 - 020

York International Corporation, York, PA  
 Applied Systems Performance Test

Level 2 StartUp Information

JOB NAME: DUPONT Date: 10/05/94  
YORK ORDER: 93-211,038-01 Time: 10:45  
UNIT MODEL: YPC-ST-226-46-C-~~XXX~~  
SERIAL NUMBER: ~~YKBM032019~~  
 GLEM 157836

CHARGING QUANTITIES:

	LiBr Solution at <u>55</u> %	Refrigerant	Alcohol
Charged for testing	<u>21870</u> lb	<u>428</u> gal	<u>37</u> gal
Removed for Shipping (1)	<u>20196</u> lb	<u>105</u> gal	---
Add for start up (1)	<u>20196</u> lb	<u>105</u> gal	---

Note: (1) LiBr and refrigerant charge shipped as 51.5 barrels of solution with an average LiBr concentration of 52.3 % + 3.5 barrels of refrigerant. Some alcohol will be in the solution and refrigerant which was removed for shipping.

CHANGED 48 BBS Bromide

# YOF INTERNATIONAL CORPORATION APPLIED SYSTEMS PERFORMANCE TEST

JOB NAME - DUPONT  
 YORK ORDER - 93-211,038-01  
 UNIT MODEL - YCP-ST-22G-46-C-XYKB  
 SERIAL NO. - YKBM032819      GLCM 157836

10/6/94

## VALVE SETTING CHART

VALVE	NAME	FINAL SETTING	REMARKS
V2	SOLUTION RETURN FROM 1st STAGE GEN.	2 1/2 TURNS OPEN	2 1/2 T OPEN <i>JH</i>
V3	SOLUTION SUPPLY TO 2nd STAGE GEN.	2 TURNS OPEN	2 T OPEN <i>JH</i>
V4	SOLUTION SUPPLY TO 1st STAGE GEN.	4 TURNS OPEN	4 T OPEN <i>JH</i>
V7	REFRIGERANT BY-PASS FLOW RATE SETTING	2 TURNS OPEN	2 J. OPEN <i>JH</i>
V8	REFRIGERANT BLOWDOWN VALVE	CLOSED	CLOSED <i>JH</i>
V9	REFRIGERANT PUMP ISOLATION VALVE-SUCTION	100% OPEN	OPEN <i>JH</i>
V10	REFRIGERANT PUMP ISOLATION VALVE-DELIVERY	100% OPEN	OPEN <i>JH</i>
V12	SOLUTION PUMP ISOLATION VALVE-SUCTION	100% OPEN	OPEN <i>JH</i>
V13	SOLUTION PUMP ISOLATION VALVE-DELIVERY	100% OPEN	OPEN <i>JH</i>
V15	PRESSURE GAUGE SHUT-OFF	CLOSED	CLOSED <i>JH</i>
V22	SOLUTION SPRAY PUMP ISOLATION - SUCTION (1)	100% OPEN	OPEN <i>JH</i>
V23	SOLUTION SPRAY PUMP ISOLATION - DELIVERY (1)	100% OPEN	OPEN <i>JH</i>
V26	SOLUTION FLOW RATE SETTING VALVE	100% OPEN	OPEN <i>JH</i>
V28	SOLUTION FLOW RATE SETTING VALVE	6 TURNS OPEN	6 TURNS OPEN <i>JH</i>
V29	SOLUTION BY-PASS VALVE	1 3/4 TURNS OPEN	1 3/4 T. OPEN <i>JH</i>
V34	SOLUTION SPRAY PUMP ISOLATION - SUCTION (2)	100% OPEN	OPEN <i>JH</i>
V35	SOLUTION SPRAY PUMP ISOLATION - DELIVERY (2)	100% OPEN	OPEN <i>JH</i>
V38	REFRIGERANT FLOW RATE SETTING VALVE	4 TURNS OPEN	4 T. OPEN <i>JH</i>
V39	PURGE VALVE	CLOSED	CLOSED <i>JH</i>
V40	PURGE VALVE	CLOSED	CLOSED <i>JH</i>
V41	PURGE VALVE	CLOSED	CLOSED <i>JH</i>
V42	PURGE VALVE	CLOSED	CLOSED <i>JH</i>
VP1	PURGE OPER. VALVE - FROM COND. TO EDUCTOR	4 TURNS OPEN	4 TURNS OPEN <i>JH</i>
VP2	PURGE OPER. VALVE - FROM PURGE TANK	CLOSED	
VP3	PURGE OPER. VALVE-FROM COND.DIRECT PURGE	CLOSED	
VP4	PURGE OPER. VALVE-FROM ABS. DIRECT PURGE	CLOSED	
VP5	PURGE OPER. VALVE -MAIN VALVE.PURGE ISOL.	CLOSED	
VP7	PURGE OPER. VALVE -MECH. BOOSTER PUMP	CLOSED	
VP8	PURGE OPER. VALVE - CHECK VALVE	SPRING NOT REMOVED	CHECK VALVE REPLACED (50)
VP11	PURGE OPER. VALVE -SOL. FLOW TO EDUCTOR	4 TURNS OPEN	4 TURNS OPEN <i>JH</i>
VA	REFRIG. CHANGEOVER - REFRIG. TO CONDENSER	100% OPEN	OPEN <i>JH</i>
VB	SOLUTION CHANGEOVER-SOLUTION TO 1st STAGE	100% OPEN	OPEN <i>JH</i>
VD1	STEAM DRAIN DISCHARGE VALVE	CLOSED	C. <i>JH</i>
VD2	STEAM DRAIN DISCHARGE VALVE	1 7/8 TURNS OPEN	1 7/8 T. OPEN <i>JH</i>