

FLOW METER SPECIFICATIONS

TAG : FE 1351
 DATE : 14-DEC-89
 LAST REVISION : 14-DEC-89 BY: JJS
 PLANT : CMP
 DESCRIPTION : HCL FROM VINYL 2

METERING DEVICE DATA *****

PIPE I. D. : 7.981 INCHES
 FLANGE TYPE : 300# RF
 PRESSURE TAP : DOWNSTREAM
 MATERIAL : 316 SS
 BETA RATIO : 0.4699
 DEVICE : SQ EDGE ORIFICE- FLANGE TAPS

FLUID PROPERTIES *****

FLUID 7)HCL GAS
 VISCOSITY : 0.014 CP
 CP/CV : 1.410

BASE CONDITIONS *****

SP GRAVITY : 1.2586
 TEMPERATURE : 15.56 DEGC
 PRESSURE : 14.730 PSIA
 DENSITY : 0.0963LB/CF
 0.00154GM/CC

FLOWING CONDITIONS *****

MAX FLOW : 638480.000 LBS /DAY CALCULATED
 DIFFERENTIAL : 100.00 IN. H2O INPUT
 BORE : 3.750 INCHES INPUT

PRESSURE : 95.00 PSIG
 TEMPERATURE : 25.00 DEGC

DENSITY : 0.7237 LB/F3 0.01159 GM/CC

LINE VELOCITY: 29.392 FT/SEC
 PIPE REYNOLDS NO. : 1503810. (CALCULATED AT 100% FLOW)

UNRECOVERABLE PRESSURE LOSS: 1.53 PSI 20111.3 KWH/YR
 (CALCULATED AT 75% FLOW) \$ 642.56 DOLLARS/YR

KOB2: 0.13625 FR : 1.00037 FA : 1.00012
 Y : 1.00325

METER CONSTANT FOR MASS FLOW PACKAGE *****

FLOW= 779219.379 * SQRT(H(IN)*DEN) = SCF /DAY

1.04

CONFIDENTIAL

DO 007350

MASS FLOW MF 1351 TYPE 3 ENTRY 4 CAL 0 OK IN SERVICE
DATA 20265.98633 LB/H HCL FROM VINYL 2 TO CMP
METER CONSTANT 3127.69604

INPUT FI 1351 TYPE 13 ENTRY 80 CAL 48 OK IN SERVICE
DATA 50.56790 IH20 HCL FROM VINYL 2 FLOW DP
SPAN 100.00 BASE 0.00

DENSITY DN 1351 TYPE 2 ENTRY 4 CAL 7 OK IN SERVICE
DATA 0.84438 #/CF L FROM VINYL 2 PMTR DENSITY

DEN TEMP TI 1353 TYPE 13 ENTRY 84 CAL 0 OK IN SERVICE
DATA -1.39583 DEGC HCL FROM VINYL 2 TEMPERATURE
SPAN 50.00 BASE 0.00

DEN PRESS PI 1382 TYPE 13 ENTRY 81 CAL 0 OK IN SERVICE
DATA 100.07405 PSIG HCL FROM VINYL 2 PRESSURE
SPAN 149.99 BASE 0.00

CONFIDENTIAL

DO 007351

LOUISIANA DIVISION
FLOW METER SPECIFICATIONS

TAG : FE 1351A
DATE : 14-DEC-87
LAST REVISION : 14-DEC-87 BY: JJS
PLANT : CKP
DESCRIPTION : HCL FROM VINYL 2 (REDUNDANT)

METERING DEVICE DATA

PIPE I. D. : 7.981 INCHES
FLANGE TYPE : 300# RF
PRESSURE TAP : DOWNSTREAM
MATERIAL : 316 SS
BETA RATIO : 0.4697
DEVICE : SQ EDGE ORIFICE- FLANGE TAPS

FLUID PROPERTIES

FLUID 7)HCL GAS
VISCOSITY : 0.014 CP
CP/CV : 1.410

BASE CONDITIONS

SP GRAVITY : 1.2586
TEMPERATURE: 15.56 DEGC
PRESSURE : 14.730 PSIA
DENSITY : 0.0963LB/CF
0.00154GM/CC

FLOWING CONDITIONS

MAX FLOW : 633480.000 LBS /DAY CALCULATED
DIFFERENTIAL : 100.00 IN. H2O INPUT
BORE : 3.750 INCHES INPUT

PRESSURE : 95.00 PSIG
TEMPERATURE : 25.00 DEGC

DENSITY : 0.7237 LB/F3 0.01159 GM/CC

LINE VELOCITY: 29.392 FT/SEC
PIPE REYNOLDS NO. : 1503810. (CALCULATED AT 100% FLOW)

UNRECOVERABLE PRESSURE LOSS: 1.53 PSI 20111.3 KWH/YR
(CALCULATED AT 75% FLOW) * 642.56 DOLLARS/YR

KOB2: 0.13625 FR : 1.00037 FA : 1.00012
Y : 1.00325

METER CONSTANT FOR MASS FLOW PACKAGE

FLOW= 3127.184 * SQRT(H(IN)*DEN) = LBS /HR

CONFIDENTIAL

DO 007352

MASS FLOW MF 1351A TYPE 3 ENTRY 67 CAL 0 OK IN SERVICE
DATA 20733.51172 LB/H HCL FROM VINYL II (METER 2)
METER CONSTANT 3127.69604

INPUT FI 1351A TYPE 13 ENTRY 408 CAL 48 OK IN SERVICE
DATA 51.75504 IH20 HCL FROM VINYL II (METER 2)
SPAN 100.00 BASE 0.00

DENSITY DN 1351 TYPE 2 ENTRY 4 CAL 7 OK IN SERVICE
DATA 0.84393 #/CF L FROM VINYL 2 PMTR DENSITY

DEN TEMP TI 1353 TYPE 13 ENTRY 84 CAL 0 OK IN SERVICE
DATA -1.55035 DEGC HCL FROM VINYL 2 TEMPERATURE
SPAN 50.00 BASE 0.00

DEN PRESS PI 1382 TYPE 13 ENTRY 81 CAL 0 OK IN SERVICE
DATA 99.88656 PSIG HCL FROM VINYL 2 PRESSURE
SPAN 149.99 BASE 0.00

CONFIDENTIAL

DO 007353

LOUISIANA DIVISION
FLOW METER SPECIFICATIONS

TAG : FE 2052
DATE : 14-DEC-89
LAST REVISION : 14-DEC-89 BY: EBB
PLANT : CHP
DESCRIPTION : HCL PURIFICATION FEED

METERING DEVICE DATA

PIPE I. D. : 7.981 INCHES
FLANGE TYPE : 300# RF
PRESSURE TAP : DOWNSTREAM
MATERIAL : 316 SS
BETA RATIO : 0.4963
DEVICE : SQ EDGE ORIFICE- FLANGE TAPS

FLUID PROPERTIES

FLUID 1) IDEAL GAS
VISCOSITY : 0.010 CP
CP/CV : 1.400

BASE CONDITIONS

SP GRAVITY : 1.2600
TEMPERATURE: 15.56 DEGC
PRESSURE : 14.730 PSIA
DENSITY : 0.0964LB/CF
0.00154GM/CC

FLOWING CONDITIONS

MAX FLOW : 28834.027 LBS /HR CALCULATED
DIFFERENTIAL : 100.00 IN. H2O INPUT
BORE : 3.961 INCHES INPUT

PRESSURE : 95.00 PSIG
TEMPERATURE : 35.00 DEGC

DENSITY : 0.6730 LB/F3 0.01078 GM/CC

LINE VELOCITY: 34.257 FT/SEC
PIPE REYNOLDS NO. : 2281866. (CALCULATED AT 100% FLOW)

UNRECOVERABLE PRESSURE LOSS: 1.49 PSI 22740.5 KWH/YR
(CALCULATED AT 75% FLOW) \$ 726.56 DOLLARS/YR

KOB2: 0.15311 FR : 1.00029 FA : 1.00044
Y : 1.00316 FFV. 1.00000

METER CONSTANT FOR MASS FLOW PACKAGE

FLOW= 3514.778 * SQRT(R(IN)*DEN) = LBS /HR

CONFIDENTIAL

DO 007354

MASS FLOW MF 2052 TYPE 3 ENTRY 30 CAL 0 OK IN SERVICE
DATA 21764.61914 LB/H HCL PURIFICATION FEED
METER CONSTANT 3509.87988

INPUT FIC 2052 TYPE 13 ENTRY 32 CAL 32 OK IN SERVICE
DATA 47.07639 IH20 HCL FLOW TO PURIFICATION
SPAN 100.00 BASE 0.00

DENSITY DN 2052 TYPE 2 ENTRY 20 CAL 7 OK IN SERVICE
DATA 0.80207 #/CF L TO PURIFICATION

DEN TEMP TI 2051 TYPE 13 ENTRY 16 CAL 0 OK IN SERVICE
DATA 9.46156 DEGC HCL TO PURIFICATION TEMPERATURE
SPAN 99.98 BASE -20.00

DEN PRESS PI 2053 TYPE 13 ENTRY 31 CAL 0 OK IN SERVICE
DATA 99.49089 PSIG INCOMING HCL HEADER PRESSURE
SPAN 199.98 BASE 0.00

0.763

P = 0.725

T = 27.2°C

P = 1.775 K

CONFIDENTIAL

DO 007355

ALT-F10 HELP | VT-100 | FDX | 9600 NB1 | LOG CLOSED | PRT OFF | CR | CR

ASS FLOW MF 2052 TYPE 3 ENTRY 30 CAL 0 OK IN SERVICE
ATA 21691.93164 LB/H HCL PURIFICATION FEED
ETER CONSTANT 3509.87988

NPL FIC 2052 TYPE 13 ENTRY 32 CAL 32 OK IN SERVICE
ATA 50.84722 IH2D HCL FLOW TO PURIFICATION
PAN 100.00 BASE 0.00

DENSITY DN 2052 TYPE 2 ENTRY 20 CAL 7 OK IN SERVICE
ATA 0.75067 #/CF L TO PURIFICATION

EN TEMP TI 2051 TYPE 13 ENTRY 16 CAL 0 OK IN SERVICE
ATA 23.78792 DEGC HCL TO PURIFICATION TEMPERATURE
PAN 99.98 BASE -20.00

EN PRESS PI 2053 TYPE 13 ENTRY 31 CAL 0 OK IN SERVICE
ATA 98.32433 PSIG INCOMING HCL HEADER PRESSURE
PAN 199.98 BASE 0.00

OUTPUT TO PRINTER [Y OR N ,D:N] ?

MFT31 -- Exiting due to ERROR 3

b PC = 000002

in "SEEMF " at 391

ALT-F10 HELP | VT-100 | FDX | 9600 NB1 | LOG CLOSED | PRT OFF | CR | CR

PAN 199.98 BASE 0.00

OUTPUT TO PRINTER [Y OR N ,D:N] ?

MFT31 -- Exiting due to ERROR 3

b PC = 000002

in "SEEMF " at 391

BMF MF929

ASS FLOW MF 929 TYPE 3 ENTRY 39 CAL 0 OK IN SERVICE
ATA 0.00000 LB/H 30# STEAM FLOW TO CMP
ETER CONSTANT 10000.04004

NPUT FR 929 TYPE 10 ENTRY 35 CAL 0 OK IN SERVICE
ATA -13.96471 IH2D 30# STEAM FLOW TO CMP

ENSLY DN 929 TYPE 1 ENTRY 43 CAL 0 OK IN SERVICE
ATA 0.10590 #/CF # STEAM FLOW CONSTANT DENSITY

CONFIDENTIAL

OUTPUT TO PRINTER [Y OR N ,D:N] ?

MFT31 -- Exiting due to ERROR 3

b PC = 000002

in "SEEMF " at 391

DO 007356

LOUISIANA DIVISION
FLOW METER SPECIFICATIONS

TAG : FE 2187
DATE : 14-DEC-89
LAST REVISION : 14-DEC-89 BY: EBB
PLANT : CKP
DESCRIPTION : C-70 FEED

METERING DEVICE DATA

*****1*

PIPE I. D. : 6.065 INCHFS
FLANGE TYPE : 300# RF
PRESSURE TAP : DOWNSTREAM
MATERIAL : 316 SS
BETA RATIO : 0.6075
DEVICE : SQ EDGE ORIFICE- FLANGE TAPS

FLUID PROPERTIES

FLUID 1) IDEAL GAS
VISCOSITY : 0.010 CP
CP/CV : 1.400

BASE CONDITIONS

SP GRAVITY : 1.2600
TEMPERATURE: 15.60 DEGC
PRESSURE : 14.730 PSIA
DENSITY : 0.0964LB/CF
0.00154GM/CC

FLOWING CONDITIONS

MAX FLOW : 36058.570 LBS /HR CALCULATED
DIFFERENTIAL : 100.00 IN. H2O INPUT
BORE : 3.684 INCHES INPUT

PRESSURE : 222.00 PSIG
TEMPERATURE : 75.00 DEGC

DENSITY : 1.2851 LB/F3 0.02059 GM/CC

LINE VELOCITY: 33.849 FT/SEC
PIPE REYNOLDS NO. : 3755085. (CALCULATED AT 100% FLOW)

UNRECOVERABLE PRESSURE LOSS: 1.27 PSI 12722.8 KWH/YR
(CALCULATED AT 75% FLOW) \$ 406.49 DOLLARS/YR

KOB2: 0.24006 FR : 1.00033 FA : 1.00174
Y : 1.00132 FPV: 1.00000

METER CONSTANT FOR MASS FLOW PACKAGE

FLOW= 3180.839 * SQRT(H(IN)*DEN) = LBS /HR

CONFIDENTIAL

DO 007357

MASS FLOW MF 2187 TYPE 3 ENTRY 31 CAL 0 OK OUT OF SERVICE
DATA 18900.00000 LB/H C-70 FEED
METER CONSTANT 3186.61011

INPUT FI 2187 TYPE 13 ENTRY 59 CAL 5 OK IN SERVICE
DATA 17.69666 M³/H C-70 FEED
SPAN 31.07 BASE 0.00

DENSITY DN 2187 TYPE 2 ENTRY 21 CAL 7 OK IN SERVICE
DATA 1.43116 #/CF 70 FEED

DEN TEMP TI 2185 TYPE 13 ENTRY 62 CAL 0 OK IN SERVICE
DATA 60.12644 DEGC K-55 DISCHARGE TEMPERATURE
SPAN 199.98 BASE 0.00

DEN PRESS PIC 2186 TYPE 13 ENTRY 61 CAL 0 OK IN SERVICE
DATA 221.82431 PSIG K-55 DISCHARGE CONTROL PRESS
SPAN 299.99 BASE 0.00

Should be
TI - 2176 ??
ND

1.34 ??

74.82 °C
223.5 PSIG
ρ = 1.383

CONFIDENTIAL
DO 007358

LOUISIANA DIVISION
FLOW METER SPECIFICATIONS

TAG : FE 2215
DATE : 14-DEC-89
LAST REVISION : 14-DEC-89 BY: JJS
PLANT : CKP
DESCRIPTION : C-70 O. H. FLOW

METERING DEVICE DATA

*****1****

PIPE I. D. : 6.055 INCHES
FLANGE TYPE : 300# RF
PRESSURE TAP : DOWNSTREAM
MATERIAL : 316 SS
BETA RATIO : 0.5560
DEVICE : SQ EDGE ORIFICE- FLANGE TAPS

FLUID PROPERTIES

FLUID 1) IDEAL GAS
VISCOSITY : 0.010 CP
CP/CV : 1.400

BASE CONDITIONS

SP GRAVITY : 1.2600
TEMPERATURE : 15.60 DEGC
PRESSURE : 14.730 PSIA
DENSITY : 0.0964 LB/CF
0.00154 GM/CC

FLOWING CONDITIONS

*****1***

MAX FLOW : 34417.777 LBS /HR CALCULATED
DIFFERENTIAL : 100.00 IN. H2O INPUT
BORE : 3.372 INCHES INPUT

PRESSURE : 222.00 PSIG
TEMPERATURE : -19.00 DEGC

DENSITY : 1.7604 LB/F3 0.02820 GM/CC

LINE VELOCITY: 27.070 FT/SEC
PIPE REYNOLDS NO. : 3584216. (CALCULATED AT 100% FLOW)

UNRECOVERABLE PRESSURE LOSS: 1.38 PSI 9598.8 KWH/YR
(CALCULATED AT 75% FLOW) * 306.68 DOLLARS/YR

KOB2: 0.19636 FR : 1.00024 FA : 0.99874
Y : 1.00140 FPV. 1.00000

METER CONSTANT FOR MASS FLOW PACKAGE

*****1*****

FLOW= 2594.047 * SQRT(H(IN)*DEN) = LBS /HR

CONFIDENTIAL

DO 007359

MASS FLOW MF 2215 TYPE 3 ENTRY 32 CAL 0 OK IN SERVICE
DATA 21808.55078 LB/H C-70 O. H. FLOW
METER CONSTANT 2594.38989

INPUT FI 2215 TYPE 13 ENTRY 20 CAL 32 OK IN SERVICE
DATA 34.05555 IH2O C-70 OVERHEAD FLOW
SPAN 100.00 BASE 0.00

DENSITY DN 2215 TYPE 2 ENTRY 22 CAL 7 OK IN SERVICE
DATA 2.07658 #/CF 70 O. H. FLOW

DEN TEMP TI 2201 TYPE 13 ENTRY 36 CAL 0 OK IN SERVICE
DATA -18.54249 DEGC C-70 OVERHEAD TEMPERATURE
SPAN 79.99 BASE -40.00

DEN PRESS PIC 2200 TYPE 13 ENTRY 42 CAL 0 OK IN SERVICE
DATA 223.07425 PSIG C-70 TOP PRESSURE
SPAN 299.99 BASE 0.00

CONFIDENTIAL

DO 007360

LOUISIANA DIVISION
FLOW METER SPECIFICATIONS

TAG : FE 2182
DATE : 14-DEC-89
LAST REVISION : 14-DEC-89 BY: EBB
PLANT : CHP
DESCRIPTION : RECYCLE FLOW TO E-51

METERING DEVICE DATA

PIPE I. D. : 6.065 INCHES
FLANGE TYPE : 300# RF
PRESSURE TAP : DOWNSTREAM
MATERIAL : 316 SS
BETA RATIO : 0.5981
DEVICE : S2 EDGE DRIFICE- FLANGE TAPS

FLUID PROPERTIES

FLUID 1) IDEAL GAS
VISCOSITY : 0.010 CP
CP/CV : 1.400

BASE CONDITIONS

SP GRAVITY : 1.2600
TEMPERATURE: 15.60 DEGC
PRESSURE : 14.730 PSIA
DENSITY : 0.0964LB/CF
0.00154GM/CC

FLOWING CONDITIONS

MAX FLOW : 34889.273 LBS /HR CALCULATED
DIFFERENTIAL : 100.00 IN. H2O INPUT
BORE : 3.627 INCHES INPUT

PRESSURE : 200.00 PSIG
TEMPERATURE : 40.00 DEGC

DENSITY : 1.2959 LB/F3 0.02076 GM/CC

LINE VELOCITY: 37.275 FT/SEC

PIPE REYNOLDS NO. : 3633317. (CALCULATED AT 100% FLOW)

UNRECOVERABLE PRESSURE LOSS: 1.29 PSI 12398.8 KWH/YR
(CALCULATED AT 75% FLOW) \$ 396.14 DOLLARS/YR

KOB2: 0.23153 FR : 1.00032 FA : 1.00060
Y : 1.00147 FPV: 1.00000

METER CONSTANT FOR MASS FLOW PACKAGE

FLOW= 3064.773 * SQRT(H(IN)*DEN) = LBS /HR

CONFIDENTIAL

DO 007361

MASS FLOW MF 2182 TYPE 3 ENTRY 33 CAL 0 OK IN SERVICE
DATA 6685.87842 LB/H RECYCLE FLOW TO E-51 (HCL PURIFI)
METER CONSTANT 3048.27002

INPUT FI 2182 TYPE 13 ENTRY 64 CAL 32 OK IN SERVICE
DATA 3.27431 IH20 RECYCLE FLOW TO E-51 (HCL PURIFI)
SPAN 100.00 BASE 0.00

DENSITY DN 2182 TYPE 2 ENTRY 23 CAL 7 OK IN SERVICE
DATA 1.43794 #/CF CYCLE FLOW

DEN TEMP TI 2177 TYPE 13 ENTRY 58 CAL 0 OK IN SERVICE
DATA 31.98094 DEGC E-72 OUTLET TEMPERATURE
SPAN 99.98 BASE 0.00

DEN PRESS PIC 2179 TYPE 13 ENTRY 63 CAL 0 OK IN SERVICE
DATA 200.07520 PSIG HCL PRESSURE TO USERS
SPAN 299.99 BASE 0.00

WHAT IS CALL 7

40.15°C

200 PSIG

$\rho = 1.39128$

Q2

1.329

0.92

CONFIDENTIAL

DO 007362

MASS FLOW MF 2182 TYPE 3 ENTRY 33 CAL 0 OK IN SERVICE
DATA 12405.62109 LB/H RECYCLE FLOW TO E-51 (HCL PURIF)
METER CONSTANT 3068 27002

INPUT FI 2182 TYPE 13 ENTRY 64 CAL 32 OK IN SERVICE
DATA 11.66319 IH2O RECYCLE FLOW TO E-51 (HCL PURIFI
SPAN 100.00 BASE 0.00

DENSITY DN 2182 TYPE 2 ENTRY 23 CAL 7 OK IN SERVICE
DATA 1.39168 #/CF CYCLE FLOW

DEN TEMP TI 2177 TYPE 13 ENTRY 58 CAL 0 OK IN SERVICE
DATA 40.08049 DEGC E-72 OUTLET TEMPERATURE
SPAN 99.98 BASE 0.00

DEN PRESS PIC 2179 TYPE 13 ENTRY 63 CAL 0 OK IN SERVICE
DATA 199.99187 PSIG HCL PRESSURE TO USERS
SPAN 299.99 BASE 0.00

CONFIDENTIAL

DO 007363

MASS FLOW MF 2182 TYPE 3 ENTRY 33 CAL 0 OK IN SERVICE
DATA 5062.75635 LB/H RECYCLE FLOW TO E-51 (HCL PURIF)
METER CONSTANT 3049.27002

INPUT FI 2182 TYPE 13 ENTRY 64 CAL 32 OK IN SERVICE
DATA 1.99653 1-H2O RECYCLE FLOW TO E-51 (HCL PURIFI
SPAN 100.00 BASE 0.00

DENSITY DN 2182 TYPE 2 ENTRY 23 CAL 7 OK IN SERVICE
DATA 1.42307 #/CF CYCLE FLOW

DEN TEMP TI 2177 TYPE 13 ENTRY 58 CAL 0 OK IN SERVICE
DATA 37.69913 DEGC E-72 OUTLET TEMPERATURE
SPAN 99.98 BASE 0.00

DEN PRESS PIC 2179 TYPE 13 ENTRY 63 CAL 0 OK IN SERVICE
DATA 202.40842 PSIG HCL PRESSURE TO USERS
SPAN 299.99 BASE 0.00

CONFIDENTIAL

DO 007364

LOUISIANA DIVISION
FLOW METER SPECIFICATIONS

TAG : FE 2190
DATE : 14-DEC-89
LAST REVISION : 14-DEC-89 BY: EBB
PLANT : CMP
DESCRIPTION : HCL TO SOLVENTS

METERING DEVICE DATA

PIPE I. D. : 6.065 INCHES
FLANGE TYPE : 300 RF
PRESSURE TAP : DOWNSTREAM
MATERIAL : 316 SS
BETA RATIO : 0.4741
DEVICE : SG EDGE ORIFICE- FLANGE TAPS

FLUID PROPERTIES

FLUID 1) IDEAL GAS
VISCOSITY : 0.010 CP
CP/CV : 1.400

BASE CONDITIONS

SP GRAVITY : 1.2600
TEMPERATURE : 15.60 DEGC
PRESSURE : 14.730 PSIA
DENSITY : 0.0964LB/CF
0.00154GM/CC

FLOWING CONDITIONS

MAX FLOW : 506363.812 LBS /DAY CALCULATED
DIFFERENTIAL : 100.00 IN. H2O INPUT
BORE : 2.8753 INCHES INPUT

PRESSURE : 200.00 PSIG
TEMPERATURE : 35.00 DEGC

DENSITY : 1.3170 LB/F3 0.02110 GM/CC

LINE VELOCITY: 22.181 FT/SEC
PIPE REYNOLDS NO. : 2197165. (CALCULATED AT 100% FLOW)

UNRECOVERABLE PRESSURE LOSS: 1.53 PSI 8723.9 KWH/YR
(CALCULATED AT 75% FLOW) * 278.73 DOLLARS/YR

KOB2: 0.13890 FR : 1.00022 FA : 1.00044
Y : 1.00164 FPV. 1.00000

METER CONSTANT FOR MASS FLOW PACKAGE

FLOW= 1838.495 * SQRT(H(IN)*DEN) = LBS /HR

CONFIDENTIAL

DO 007365

MASS FLOW MF 2190 TYPE 3 ENTRY 43 CAL 0 OK IN SERVICE
DATA 14074.53125 LB/H HCL TO SOLVENTS II PAYMETER
METER CONSTANT 1637.94995

INPUT FI 2190 TYPE 13 ENTRY 97 CAL 48 OK IN SERVICE
DATA 41.72253 IH2O HCL TO SOLVENTS II FLOW
SPAN 100.00 BASE 0.00

DENSITY DN 2190 TYPE 2 ENTRY 25 CAL 7 OK IN SERVICE
DATA 1.44338 #/CF L TO SOLVENTS II DENSITY

DEN TEMP TI 2109 TYPE 13 ENTRY 99 CAL 0 OK IN SERVICE
DATA 27.61826 DEGC HCL TO SOLVENTS TEMPERATURE
SPAN 99.98 BASE 0.00

DEA PRESS PI 2191 TYPE 13 ENTRY 98 CAL 0 OK IN SERVICE
DATA 197.14824 PSIG HCL TO SOLVENTS II PRESSURE
SPAN 299.99 BASE 0.00

CONFIDENTIAL

DO 007366

LOUISIANA DIVISION
FLOW METER SPECIFICATIONS

TAG : FE 2180
DATE : 14-DEC-87
LAST REVISION : 14-DEC-87 BY: JJS
PLANT : CMP
DESCRIPTION : HCL TO SOLVENTS PAYMETER

METERING DEVICE DATA

PIPE I. D. : 6.065 INCHES
FLANGE TYPE : 300# RF
PRESSURE TAP : DOWNSTREAM
MATERIAL : 316 SS
BETA RATIO : 0.4741
DEVICE : S2 EDGE ORIFICE- FLANGE TAPS

FLUID PROPERTIES

FLUID 1) IDEAL GAS
VISCOSITY : 0.010 CP
CP/CV : 1.400

BASE CONDITIONS

SP GRAVITY : 1.2600
TEMPERATURE : 15.60 DEGC
PRESSURE : 14.730 PSIA
DENSITY : 0.0964LB/CF
0.00154GM/CC

FLOWING CONDITIONS

MAX FLOW : 522559.937 LBS /DAY CALCULATED
DIFFERENTIAL : 100.00 IN. H2O INPUT
BORE : 2.8753 INCHES INPUT

PRESSURE : 200.00 PSIG
TEMPERATURE : 35.00 DEGC

DENSITY : 1.4026 LB/F3 0.02247 GM/CC

LINE VELOCITY: 21.493 FT/SEC
PIPE REYNOLDS NO. : 2267442. (CALCULATED AT 100% FLOW)

UNRECOVERABLE PRESSURE LOSS: 1.53 PSI 8453.3 KWH/YR
(CALCULATED AT 75% FLOW) \$ 270.08 DOLLARS/YR

KDB2: 0.13890 FR : 1.00021 FA : 1.00044
Y : 1.00164 FPV: 1.03200

METER CONSTANT FOR MASS FLOW PACKAGE

FLOW= 1838.470 * SQRT(H(IN)*DEN) = LBS /HR

CONFIDENTIAL

DO 007367

MASS FLOW MF 2180 TYPE 3 ENTRY 42 CAL 0 OK IN SERVICE
DATA 14191.14844 LB/H HCL TO SOLVENTS FROM CMP
METER CONSTANT 1837.94995

INPUT FI 2180 TYPE 13 ENTRY 95 CAL 48 OK IN SERVICE
DATA 39.44102 IHQD HCL TO SOLVENTS I FLOW
SPAN 100.00 BASE 0.00

DENSITY DN 2180 TYPE 2 ENTRY 24 CAL 7 OK IN SERVICE
DATA 1.48678 #/CF L TO SOLVENTS I DENSITY

DEN TEMP TI 2189 TYPE 13 ENTRY 99 CAL 0 OK IN SERVICE
DATA 27.61826 DEGC HCL TO SOLVENTS TEMPERATURE
SPAN 99.98 BASE 0.00

DEN PRESS PI 2188 TYPE 13 ENTRY 96 CAL 0 OK IN SERVICE
DATA 202.96049 PSIG HCL TO SOLVENTS I PRESSURE
SPAN 299.99 BASE 0.00

CONFIDENTIAL

DO 007368

LOUISIANA DIVISION
FLOW METER SPECIFICATIONS

TAG : FE 2181A
DATE : 14-DEC-89
LAST REVISION : 14-DEC-89 BY: JJS
PLANT : CMP
DESCRIPTION : HCL TO CMP PAYMETER

METERING DEVICE DATA

* *****

PIPE I. D. : 6.065 INCHES
FLANGE TYPE : 300# RF
PRESSURE TAP : DOWNSTREAM
MATERIAL : 316 SS
BETA RATIO : 0.4288
DEVICE : SQ EDGE ORIFICE- FLANGE TAPS

FLUID PROPERTIES

FLUID 1) IDEAL GAS
VISCOSITY : 0.010 CP
CP/CV : 1.400

BASE CONDITIONS

SP GRAVITY : 1.2600
TEMPERATURE : 15.60 DEGC
PRESSURE : 14.730 PSIA
DENSITY : 0.0964 LB/CF
0.00154 GM/CC

FLOWING CONDITIONS

MAX FLOW : 542865.500 LBS /DAY CALCULATED
DIFFERENTIAL : 175.00 IN. H2O INPUT
BDRE : 2.6007 INCHES INPUT

PRESSURE : 200.00 PSIG
TEMPERATURE : 35.00 DEGC

DENSITY : 1.3170 LB/F3 0.02110 GM/CC

LINE VELOCITY: 23.780 FT/SEC
PIPE REYNOLDS NO. : 2355550. (CALCULATED AT 100% FLOW)

UNRECOVERABLE PRESSURE LOSS: 2.80 PSI 17162.7 KWH/YR
(CALCULATED AT 75% FLOW) \$ 548.35 DOLLARS/YR

KOB2: 0.11243 FR : 1.00015 FA : 1.00044
Y : 1.00293 FPV. 1.00000

METER CONSTANT FOR MASS FLOW PACKAGE

FLOW= 1489.955 * SQRT(H(IN)*DEN) = LBS /HR

CONFIDENTIAL

DO 007369

MASS FLOW MF 2181A TYPE 3 ENTRY 17 CAL 0 OK IN SERVICE
DATA 5934.71045 LB/H HCL TO CMP (METER 2)
METER CONSTANT 1429 57996

INPUT FI 2181A TYPE 13 ENTRY 405 CAL 48 OK IN SERVICE
DATA 11.37628 1H2O HCL TO CMP (METER 2)
SPAN 175.00 BASE 0.00

DENSITY DN 2181 TYPE 2 ENTRY 26 CAL 7 OK IN SERVICE
DATA 1.17466 #/CF L TO CMP DENSITY

DEN TEMP TI 2187 TYPE 13 ENTRY 102 CAL 0 OK IN SERVICE
DATA 28.66661 DEGC HCL TO CMP TEMPERATURE
SPAN 99.98 BASE 0.00

DEN PRESS PI 2192 TYPE 13 ENTRY 101 CAL 0 OK IN SERVICE
DATA 161.14970 PSIG HCL TO CMP PRESSURE
SPAN 299.99 BASE 0.00

CONFIDENTIAL
DO 007370

LOUISIANA DIVISION
FLOW METER SPECIFICATIONS

TAG : FE 2181
DATE : 14-DEC-89
LAST REVISION : 14-DEC-89 BY: JJS
PLANT : CMP
DESCRIPTION : HCL TO CMP PAYMETER

METERING DEVICE DATA

PIPE I. D. : 6.065 INCHES
FLANGE TYPE : 300# RF
PRESSURE TAP : DOWNSTREAM
MATERIAL : 316 SS
BETA RATIO : 0.4283
DEVICE : SQ EDGE ORIFICE- FLANGE TAPS

FLUID PROPERTIES

FLUID 1) IDEAL GAS
VISCOSITY : 0.010 CP
CP/CV : 1.400

BASE CONDITIONS

SP GRAVITY : 1.2600
TEMPERATURE : 15.60 DEGC
PRESSURE : 14.730 PSIA
DENSITY : 0.0964 LB/CF
0.00154 GM/CC

FLOWING CONDITIONS

MAX FLOW : 542865.500 LBS /DAY CALCULATED
DIFFERENTIAL : 175.00 IN. H2O INPUT
BORE : 2.6007 INCHES INPUT

PRESSURE : 200.00 PSIG
TEMPERATURE : 35.00 DEGC

DENSITY : 1.3170 LB/F3 0.02110 GM/CC

LINE VELOCITY: 23.780 FT/SEC
PIPE REYNOLDS NO. : 2355550. (CALCULATED AT 100% FLOW)

UNRECOVERABLE PRESSURE LOSS: 2.80 PSI 17162.7 KWH/YR
(CALCULATED AT 75% FLOW) \$ 548.35 DOLLARS/YR

KOB2: 0.11243 FR : 1.00015 FA : 1.00044
Y : 1.00293 FPV: 1.00000

METER CONSTANT FOR MASS FLOW PACKAGE

FLOW= 1489.755 * SQRT(H(IN)*DEN) = LBS /HR

CONFIDENTIAL

DO 007371

MASS FLOW MF 2181 TYPE 3 ENTRY 44 CAL 0 BAD IN SERVICE
DATA 0.00000 L2/H HCL TO CMP PAYMETER
METER CONSTANT 1489.57996

INPUT FI 2181 TYPE 13 ENTRY 100 CAL 48 BAD IN SERVICE
DATA 0.00000 IH20 HCL TO CMP FLOW
SPAN 175.00 BASE 0.00

DENSITY DN 2181 TYPE 2 ENTRY 26 CAL 7 OK IN SERVICE
DATA 1.17537 #/CF L TO CMP DENSITY

DEN TEMP TI 2187 TYPE 13 ENTRY 102 CAL 0 OK IN SERVICE
DATA 28.66661 DEGC HCL TO CMP TEMPERATURE
SPAN 99.98 BASE 0.00

DEN PRESS PI 2192 TYPE 13 ENTRY 101 CAL 0 OK IN SERVICE
DATA 161.14970 PSIG HCL TO CMP PRESSURE
SPAN ~~100.00~~ BASE 0.00

CONFIDENTIAL

DO 007372

DOW CHEMICAL USA
LOUISIANA DIVISION
FLOW METER SPECIFICATIONS

TAG : FE 2212
DATE : 01-DEC-87
LAST REVISION : 06-SEP-87 BY: EBB
PLANT : CNP
DESCRIPTION : FREON TO E-73

METERING DEVICE DATA

PIPE I. D. : 2.067 INCHES
FLANGE TYPE : 300# RF
PRESSURE TAP : DOWNSTREAM
MATERIAL : 316 SS
BETA RATIO : 0.5488
DEVICE : SQ EDGE ORIFICE- FLANGE TAPS

FLUID PROPERTIES

FLUID 31) GENERAL LIQ
VISCOSITY : 0.500 CP

BASE CONDITIONS

SP GRAVITY : 1.4800
TEMPERATURE: 15.60 DEGC
PRESSURE : 14.730 PSIA
DENSITY : 92.3017LB/CF
1.47856GM/CC

FLOWING CONDITIONS

MAX FLOW : 20000.000 LBS /HR INPUT
DIFFERENTIAL : 50.00 IN. H2O INPUT
BORE : 1.1344 INCHES CALCULATED

PRESSURE : 100.00 PSIG
TEMPERATURE : -28.00 DEGC

FLOWING GRAV : 1.4800
DENSITY : 92.3017 LB/F3 1.47856 GM/CC

LINE VELOCITY: 2.583 FT/SEC
PIPE REYNOLDS NO. : 122225. (CALCULATED AT 100% FLOW)

UNRECOVERABLE PRESSURE LOSS: 0.70 PSI 53.7 KWH/YR
(CALCULATED AT 75% FLOW) \$ 1.72 DOLLARS/YR

KOB2: 0.19158 FR : 1.00343 FA : 0.99846

METER CONSTANT FOR MASS FLOW PACKAGE

FLOW= 23.86067 * SQRT(H(IN)*DEN) = GAL /HR

CONFIDENTIAL

DO 007373

ASS FLOW MF 2212 TYPE 3 ENTRY 34 CAL 0 OK IN SERVICE
ATA 7249.41504 LB/H FREON TO E-73
ETER CONSTANT 294.39999

NPUT FIC 2212 TYPE 13 ENTRY 47 CAL 32 OK IN SERVICE
ATA 6.55556 IH2O FREON FLOW TO E-73
PAN 50.00 BASE 0.00

ENSITY DN 2212 TYPE 1 ENTRY 38 CAL 0 OK IN SERVICE
ATA 92.30000 #/CF EON TO E-73

OUTPUT TO PRINTER [Y OR N ,D:N] ?
MFT31 -- Exiting due to ERROR 3
t PC = 000002
in "SEEMF " at 391

ALT-F10 HELP | VT-100 | FDX | 9600 NB1 | LOG CLOSED | PRT OFF | CR | CR

OUTPUT TO PRINTER [Y OR N ,D:N] ?
MFT31 -- Exiting due to ERROR 3
t PC = 000002
in "SEEMF " at 391

BMF MF2208

ASS FLOW MF 2208 TYPE 3 ENTRY 37 CAL 0 OK IN SERVICE
ATA 23354.21484 LB/H FREON FLOW TO E-74
ETER CONSTANT 196.73000

NPUT FIC 2208 TYPE 13 ENTRY 21 CAL 32 OK IN SERVICE
ATA 175.16667 IH2O FREON TO E-74 (C-70 REBOILER)
PAN 200.00 BASE 0.00

ENSITY DN 2208 TYPE 1 ENTRY 41 CAL 0 OK IN SERVICE
ATA 80.45220 #/CF EON FLOW TO E-74 CONSTANT DENS

OUTPUT TO PRINTER [Y OR N ,D:N] ?
MFT31 -- Exiting due to ERROR 3
t PC = 000002
in "SEEMF " at 391

ALT-F10 HELP | VT-100 | FDX | 9600 NB1 | LOG CLOSED | PRT OFF | CR | CR

ASS FLOW MF 2052 TYPE 3 ENTRY 30 CAL 0 OK IN SERVICE ✓
ATA 21763.52344 LB/H HCL PURIFICATION FEED
ETER CONSTANT 3509.87988

NPUT FIC 2052 TYPE 13 ENTRY 32 CAL 32 OK IN SERVICE
ATA 51.23611 IH2O HCL FLOW TO PURIFICATION
PAN 100.00 BASE 0.00

ENSITY DN 2052 TYPE 2 ENTRY 20 CAL 7 OK IN SERVICE
TA 0.75041 #/CF L TO PURIFICATION

TEMP TI 2051 TYPE 13 ENTRY 16 CAL 0 OK IN SERVICE
23.86082 DEGC HCL TO PURIFICATION TEMPERATURE
99.98 BASE -20.00

CONFIDENTIAL

REF PI 2053 TYPE 13 ENTRY 31 CAL 0 OK IN SERVICE
98.43543 PSIG INCOMING HCL HEADER PRESSURE

DO 007374

DOW CHEMICAL USA
LOUISIANA DIVISION
FLOW METER SPECIFICATIONS

TAG : FE 2208
DATE : 01-DEC-89
LAST REVISION : 24-JUN-83 BY:
PLANT : CMP
DESCRIPTION : FREON TO E-74

METERING DEVICE DATA

PIPE I. D. : 4.026 INCHES
FLANGE TYPE : 300#RF
PRESSURE TAP : DOWNSTREAM
MATERIAL : 316 SS
BETA RATIO : 0.2378
DEVICE : SQ EDGE ORIFICE- FLANGE TAPS

FLUID PROPERTIES

FLUID 31)GENERAL LIQ
VISCOSITY : 0.500 CP

BASE CONDITIONS

SP GRAVITY : 1.2900
TEMPERATURE: 15.60 DEGC
PRESSURE : 14.730 PSIA
DENSITY : 80.4521LB/CF
1.28874GM/CC

FLOWING CONDITIONS

MAX FLOW : 24965.648 LBS /HR CALCULATED
DIFFERENTIAL : 200.00 IN. H2O INPUT
BORE : 0.9575 INCHES INPUT

PRESSURE : 226.00 PSIG
TEMPERATURE : 40.00 DEGC

FLOWING GRAV : 1.2900
DENSITY : 80.4521 LB/F3 1.28874 GM/CC

LINE VELOCITY: 0.975 FT/SEC
PIPE REYNOLDS NO. : 78332. (CALCULATED AT 100% FLOW)

UNRECOVERABLE PRESSURE LOSS: 3.70 PSI 409.4 KWH/YR
(CALCULATED AT 75% FLOW) \$ 13.08 DOLLARS/YR

KOB2: 0.03375 FR : 1.00149 FA : 1.00060

METER CONSTANT FOR MASS FLOW PACKAGE

FLOW= 18.30126 * SQRT(H(IN)*DEN) = GAL /HR

CONFIDENTIAL

DO 007375

MASS FLOW MF 2208 TYPE 3 ENTRY 37 CAL 0 OK IN SERVICE
DATA 15879.79297 LB/H FREON FLOW TO E-74
METER CONSTANT 196.73000

INPUT FIC 2208 TYPE 13 ENTRY 21 CAL 32 OK IN SERVICE
DATA 80.98611 IH2O FREON TO E-74 (C-70 REBOILER)
SPAN 200.00 BASE 0.00

DENSITY DN 2208 TYPE 1 ENTRY 41 CAL 0 OK IN SERVICE
DATA 80.45220 #/CF EON FLOW TO E-74 CONSTANT DENS

CONFIDENTIAL

DO 007376