

LINE SIZING SPREADSHEET

PER ASHRAE RP-185

5/16/02 19:27

Compliments of Nigel Andrews - Freeze-Pro, Inc.

TO:
FROM: Jeff Welch
REF:

Project Name
P&I diagram point

REV 2-1-00

Saturated Suction Temperature Lbs/Hour 12882.9
 Condensing/Liquid Temperature Lbs/Minute 214.7
 Tons AMMONIA

SINGLE PHASE LINES

Discharge gas temperature

| Suction Line Max. DP/100' | | | 0.5 | Liq Line Max DP/100' | | | 2 | Discharge Line Max. DP/100' | | | 2 |
|---------------------------|---------|---------|----------|----------------------|---------|----------|----------|-----------------------------|----------|--|---|
| Nom. Dia | DP/100' | DT/100' | Velocity | Nom. Dia | DP/100' | Velocity | Nom. Dia | DP/100' | Velocity | | |
| 8 | 0.18 | 0.20 | 72.1 | 2 | 1.13 | 4.8 | 4 | 1.67 | 77.2 | | |
| 10 | 0.06 | 0.06 | 45.8 | 2-1/2 | 0.33 | 2.9 | 5 | 0.52 | 49.1 | | |
| 12 | 0.02 | 0.03 | 32.2 | 3 | 0.11 | 1.9 | 6 | 0.20 | 34.0 | | |

LIQUID OVERFEED LINES

Recirculation Rate
 Mass flow Lbs/Min. 536.4

DEFROST LINES

Supply Pressure, Psig 151.8 Total Defrost Tons
 Sat. Temp, deg F Hot Gas flow multiplier
 Actual gas temp, F Lbs/ Minute 111.9

| 2 PH Suction Max. DP/100' * | | | 0.5 | R'circ. Liq Max. DP/100' | | | 2 | Defrost Line Max. DP/100' | | | 2 |
|-----------------------------|---------|---------|----------|--------------------------|---------|----------|----------|---------------------------|----------|--|---|
| Nom. Dia | DP/100' | DT/100' | Velocity | Nom. Dia | DP/100' | Velocity | Nom. Dia | DP/100' | Velocity | | |
| 8 | 0.37 | 0.41 | 60.5 | 2-1/2 | 1.78 | 6.59 | 4 | 0.52 | 45.1 | | |
| 10 | 0.12 | 0.13 | 38.4 | 3 | 0.59 | 4.27 | 5 | 0.16 | 28.7 | | |
| 12 | 0.05 | 0.05 | 27.0 | 4 | 0.15 | 2.48 | 6 | 0.06 | 19.9 | | |

CONDENSER PIPING

Number of cond. In/out pairs (ie. For 1 coil inlet & outlet; enter 1)

| Inlet per coil | | Outlet per coil | | Outlet header | | Equalizer | |
|----------------|---------|-----------------|------|---------------|-------|-----------|---------|
| Max. ΔP | 2 | Mx Vel FPM | 100 | Mx Vel FPM | 150 | Max. ΔP | 1.4 |
| Nom. Dia | DP/100' | Nom. Dia | FPM | Nom. Dia | FPM | Nom. Dia | DP/100' |
| 2-1/2 | 1.83 | 2 | 82.8 | 3 | 132.4 | 1 | 0.968 |
| 3 | 0.59 | 2-1/2 | 51.1 | 4 | 76.9 | 1-1/4 | 0.212 |
| 4 | 0.15 | 3 | 33.1 | 5 | 48.9 | 1-1/2 | 0.091 |

THERMOSIPHON PIPING AND HORIZONTAL VESSEL

Thermosiphon MBH 5 Minute volume 4.7
 Overfeed rate Vessel Dia., in
 Lbs/Minute, Sat.flow 34.54 Required Length, ft 1.9
 Vel. FPM @ 50% full 21.6

| Thermosiphon Supply | | | Thermosiphon Return * | | | Vent | |
|---------------------|---------|----------|-----------------------|---------|----------|----------|---------|
| Max. ΔP | 0.1 | | Max. ΔP | 0.5 | | Max. ΔP | 0.2 |
| Nom. Dia | DP/100' | Velocity | Nom. Dia | DP/100' | Velocity | Nom. Dia | DP/100' |
| 3 | 0.05 | 1.2 | 4 | 0.16 | 10.5 | 3 | 0.15 |
| 4 | 0.01 | 0.7 | 5 | 0.05 | 6.7 | 4 | 0.04 |
| 5 | 0.00 | 0.5 | 6 | 0.02 | 4.6 | 5 | 0.01 |

* Two phase pressure drop estimated by Beattie method. Use with judgement. See README page.