

APPENDIX VII

TRAY DRYER PERFORMANCE

Vacuum

Tray Size - $22" \times 40" \times 1.5" = 0.76 \text{ ft.}^3/\text{tray}$
Number of Trays - 34/dryer
Lbs. QA (dry) per tray = 12
Lbs. dry QA/Dryer = 410# dry/QA/dryer
Average Cycle (Measured) = 16.5 hrs.
Assume 90% utilization = $16.5/.9 = 18.25$ hours
 $410\#/18.25 \text{ hrs.} = 22.5\#/\text{hr.}$
This is performance of Red 547 tray dryers.

Air

Tray Size = $24 \times 24 \times 1" = 0.333 \text{ ft.}^3/\text{tray}$
Number of Trays = 88/dryer
Lbs. QA (dry) per tray = 8 lbs./tray
Lbs. dry QA/dryer = 705#/dryer
Average Cycle = 16 hrs.
Assume 90% utilization = $16/.9 = 17.75$
 $705\#/17.75 = 39.7\#/\text{hour/dryer}$
This is performance of Newark air tray dryers.

Air (CPC)

Tray Size - $25.5 \times 25.5 \times 1.5 = 0.56 \text{ ft.}^3/\text{tray}$
Number of trays = 44 trays/cart $\times$ 2 carts/dryer = 88 trays/dryer
Lbs. QA (dry)/tray = $0.56 \text{ ft.}^3 \times 70\#/\text{ft.}^3 \times 0.3\# \text{ QA}/\# \text{ cake} = 11.75\#/\text{tray}$
Lbs. dry QA/dryer = $88 \times 11.75 = 1040\#/\text{dryer}$
Cycle (to 0.5% moisture) = 24 hrs. at 90% util. = 26.7
 $\#/\text{hr.} = 1040/26.7 = 39\#/\text{hr.}$

All dryers are steam heated. The dryers and the trays must be thoroughly washed out after use.

It appears the drying rate in air dryers is about
 $\frac{705\# \text{ Dry QA}}{17.75 \text{ hrs.}} \times \frac{26.5 \text{ ft.}^3}{26.5 \text{ ft.}^3} = \frac{1.5\# \text{ dry QA}}{\text{hr. ft.}^3}$
which is roughly equivalent to $\frac{3.5\# \text{ H}_2\text{O evaporated}}{\text{hr. ft.}^3 \text{ material charged}}$

Drying Rate for Vacuum

$\frac{410\# \text{ Dry QA}}{18.25 \text{ hrs.} \times 25.9 \text{ ft.}^3} = \frac{0.8\# \text{ dry QA}}{\text{hr. ft.}^3}$
which is roughly equivalent to $\frac{2\# \text{ H}_2\text{O evaporated}}{\text{hr. ft.}^3 \text{ material charged}}$