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***Content Based
Chemical Engineering***

PAPER STOCK FLOW THRU SLICE (HEADBOX), find flow

REFERENCES: Fluid Mechanics Committee of the Engineering Division - TAPPI; "Fan Pump Calculations", TIS 0410-01; "Flow from a nozzle (slice) with inclined upper lip," - TIS 0410-04; "Flow from a vertical slice," - TIS 0410-02; "Flow from a 45 degree," - TIS 0410-03; "Head of stock behind slice (Head/jet relationships)," - TIS 0410-05

NOTE: Always begin a new case by retrieving the original file. Direct entry of data in cells that originally contain table lookups could cause functions to be lost, or incorrect calculations. I format cells requiring entry colored **RED**; calculated values are black.

- 1.) Enter the service at [C4].
- 2.) Enter the motive pressure either fan pump or padding/hydraulic head at [C8].
- 3.) Enter the slice height at [F8].
- 4.) Enter the slice width at [F9].

The "jet velocity" in feet per minute (imperial) or meter per minute (metric) is calculated and shown at [C9]. The unit conversion constant of 0.05195 (imperial) or 1.67E-08 (metric) is given at [C10].

The FLOW in GPM (imperial) or M³/sec (metric) is calculated and shown at [E13].

Print out using direct EXCEL commands.

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The originator of these spreadsheet(s) specifically excludes all warranties, expressed or implied, as to the accuracy of the data and other information set forth and assumes NO liability for any losses or damage resulting from the use of the materials or application of the data.

Consistent with GOOD ENGINEERING PRACTICE, the burden rests with the USER of these spreadsheets to review ALL calculations, and assumptions. The USER IS FULLY RESPONSIBLE for the results or decisions based on calculations.

This Spreadsheet Requires MACROS to be ENABLED to ASSURE proper operation. See the Workbook Help Sheet for Additional Instructions on Use.

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Paper Stock Flow Thru Slice, Find Flow

HEAD BOX: # 5 Paper Machine

· STOCK DATA ·

$P_1 = 12.00$ psig
 $V_1 = 2532$ ft/min
 $K_1 = 0.05195$ unit conv.

· SLICE DATA ·

$h = 0.100$ height of opening, in
 $w = 130.000$ width of opening, in
 $A = 13.000$ in²

$$Q = h * w * V_1 * K_1 = 1,710 \text{ gpm}$$

Paper Stock Flow Thru Slice, Find Flow

HEAD BOX: # 5 Paper Machine

· STOCK DATA ·

$P_1 = 82.737088$ kPa
 $V_1 = 772$ meter/min
 $K_1 = 1.67E-08$ unit conv.

· SLICE DATA ·

$h = 2.540$ height of opening, mm
 $w = 3302.000$ width of opening, mm
 $A = 8387.080$ mm²

$$Q = h * w * V_1 * K_1 = 0.107884 \text{ m}^3/\text{sec}$$