

RELIEF VALVE DISCHARGE CALCULATION

CONFIDENTIAL

Reactor D-744

11:40 P.M. - April 14, 1982

From: Teledyne Farris Catalog No. FE-80-1000
page 3.01, Safety Relief Valve Sizing

$$A = \frac{W \sqrt{T} \sqrt{Z}}{CK_o P \sqrt{M} K_v}$$

Where: A = Effective Orifice, in.² = 16 in.²
W = Relieving Rate, pounds per hour
T = Inlet Temperature, °R = 612°R
Z = Compressability Factor = 0.82
C = Nozzle Gas Constant = 326
P = Relieving Pressure, psia = 169.7 psia
K_o = Coefficient of Discharge = 0.953
M = Molecular Weight of Discharge = 62.5
K_v = Backpressure Sizing Factor = 1.0

$$\text{Then } W = \frac{(16.0) (326) (0.953) (169.7) (\sqrt{62.5}) (1.0)}{(\sqrt{612}) (\sqrt{0.82})}$$

$$W = 297,690 \text{ pounds per hour}$$

Vinyl chloride discharged in two seconds =

$$\frac{(297,690 \text{ pounds})}{\text{hr.}} \frac{(1 \text{ hr.})}{3600 \text{ sec.}} (2 \text{ sec.}) = 165 \text{ pounds}$$

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