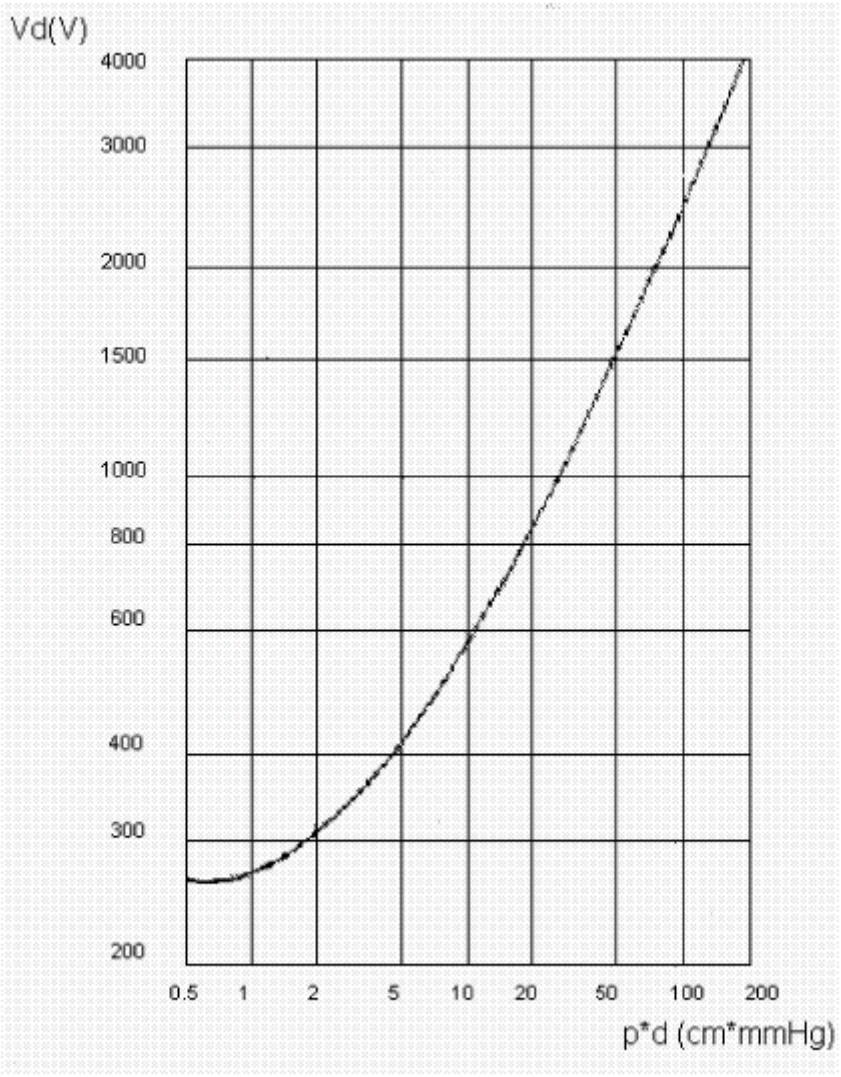


Fig. 5. Paschen curve for xenon (after Ref. [9])

it is conservative to linear extrapolate, since
the curve appears slightly quadratic

$$dVdpd := \frac{4000V - 1500V}{180cm \cdot torr - 49cm \cdot torr}$$

$$dVdpd_{air} := \frac{10000V - 2000V}{80in \cdot torr - 9.5in \cdot torr}$$

$$dVdpd = 19.084 \frac{V}{cm \cdot torr}$$

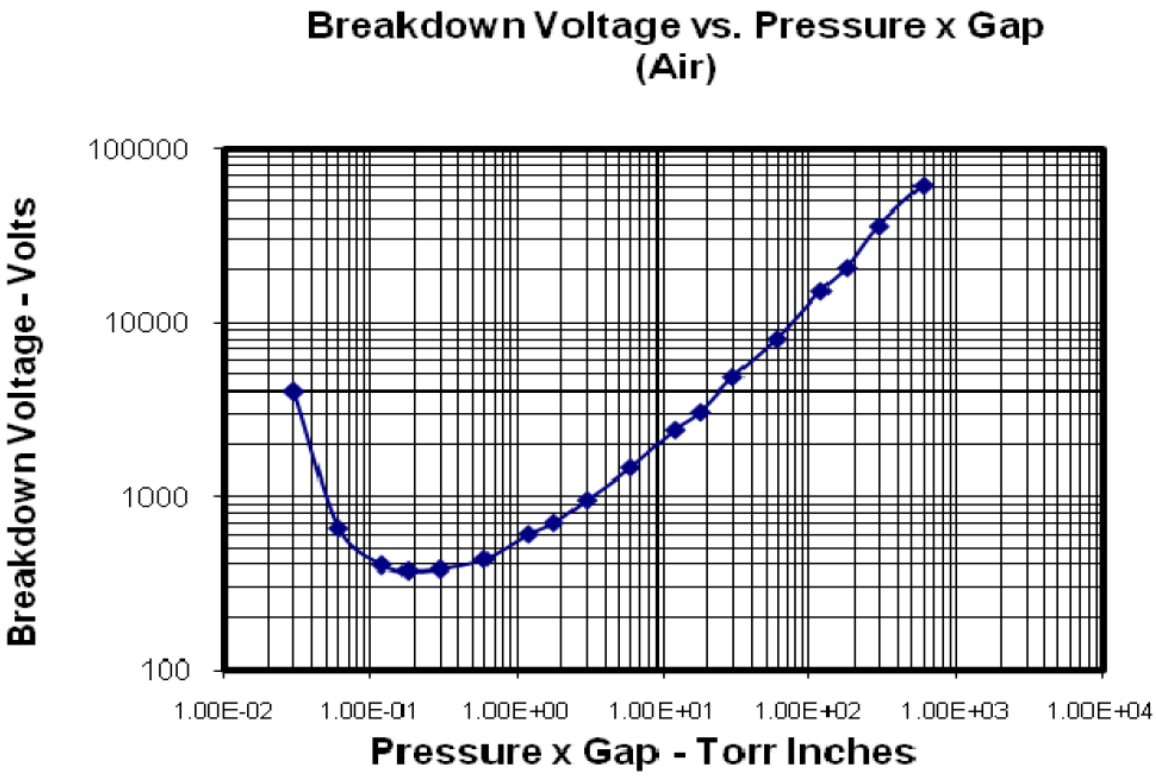
$$V_{bd} := dVdpd \cdot p \cdot d$$

$$V_{bd} := 21000V \qquad p := 2 \cdot 10^{6} Pa$$

$$d := \frac{V_{bd}}{dVdpd \cdot p} \qquad d = 0.029\,in$$

any wire radius several times larger than d will approximate ideal plane to plane geometry. The rough inner surface of the vessel should be lined locally with a smooth ground foil.

$$\frac{V_{bd}}{d} = 28.628\,\frac{kV}{mm}$$



at 150 psi

$pd := 200torr \cdot in$

$p_{max} := 760 \cdot 10torr$

$$d_{min} := \frac{pd}{p_{max}}$$

$d_{min} = 0.026\,in$