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Corona Part 3: Rise of the Machines

Corona can appear in systems as low as 50V.

For 50 volts to produce corona, it takes a radius of curvature of less than 6.56 x 10-4 inches (0.000656 in). In research, Electrical Engineers have been able to obtain corona down to this level. It is safe to assume that there is some non-linearity involved in actual practice because this formula is derived from the maximum charge a sphere can store in freespace under ideal conditions.

Formula for breakdown of air at STP is:

$$Vmax = Rin * 3000 / 39.3700787402$$

Where:
Vmax is the maximum voltage attainable prior to breakdown
Rin is the radius of curvature in inches (i.e., 1in radius for a 2in diameter ball)
Other values are constants

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