Comments on 'The temperature dependence of homogeneous field breakdown in synthetic air' by W.S. Zaengl et al

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EDITORIAL FOOTNOTE

In the above paper by Zaengl, Yimvuthikul and Friedrich, the unit Townsend (Td) is employed when referring to gaseous collision parameters. For this unit we have

$$1 \text{ Td} = 10^{-17} \text{ V cm}^2 = 10^{-18} \text{ kV mm}^2$$

The Townsend was introduced by gas-discharge physicists [1, 2] who prefer to employ the gas number density N when referring to the energy related parameter E/N rather than E/p , where p is the gas pressure at temperature T , and E the electric field strength.

With reference to electrical insulation, it may be argued that, on grounds of its magnitude, the Townsend is an impractical unit. In addition, p and T remain the

measured variables from which the corresponding N is deduced via the ideal gas law. If however, the gas in question is non-ideal, e.g. SF_6 , the evaluation of N also requires a knowledge of the gas compressibility factor $Z(p, T)$, $Z \leq 1$. Values of Z can be derived if the relevant virial coefficients are known.

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