

Static Dissipator Neutralization Efficiency

Kelly Robinson

Electrostatic Answers, USA

e-mail: Kelly.Robinson@ElectrostaticAnswers.com

Abstract— Static charges can cause a number of problems including sparks that ignite fires, shock people, and cause logic errors. Static charges cause sheets to stick and attract airborne contaminants. Many static dissipators are commercially available for controlling static on webs and sheets. The performance of a active static dissipator used to neutralize the charges on the web is analyzed to find that 3 key parameters determine the neutralization efficiency;

1. the number of corona ions produced by the static dissipator (dissipator design)
2. the length of the web within the ionization field of the dissipator (dissipator installation), and
3. the web speed (process)

Analysis shows that the neutralization efficiency depends on the electric Reynolds number Re , which is the ratio of time that the web is exposed to ions from the static dissipator to the dissipator time constant that is determined by the number of ions produced by the static dissipator. A key result is that the performance of an active static bar is independent of the gap between the static bar and the web. Rather, the web distance that is exposed to ions from the ionizer is the key parameter.