

Abstract Submitted
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Time resolved studies of an industrial scale APGD system processing polymer film¹ WILLIAM GRAHAM, DAMIAN DELLA CROCE, LUCAS SCHAPER, Centre for Plasma Physics, Queens University Belfast, Northern Ireland, ALAN HYNES, LIAM O'NEILL, Dow Corning Plasma Solutions, Middleton, Ireland — Time-resolved electrical, light emission and imaging characterisation of an industrial scale (1800cm²) atmospheric pressure plasma system operated under conditions which optimise polymer film processing is reported. The electrical and emission behaviour generally associated with uniform discharges i.e. a single discharge event per applied voltage half cycle, is observed at low input (<500W) powers. As the power and hence applied voltage is increased more, but similar duration, individual discharge events are observed per half cycle until, at > 900W, only about 25% of the applied voltage cycle is free of discharge production. Imaging of the inter-electrode gap shows that, at the peak of each discharge event, crossing the gap there is a uniform layer of emission close to the cathode then evidence of a dark layer and then further emission but at much reduced intensity. This is the spatial structure associated with glow discharge behaviour. Results with static or moving polymer film in the gap, which are similar, will also be reported. The assistance of B. Twomey and D. Dowling (UC Dublin) is gratefully acknowledged.

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