



## Electron Beam Application in Industrial Polymer Processing – Review and Outlook

G. Gielenz  
HUBER + SUHNER AG  
Switzerland

The various established industrial electron beam (EB) applications as related to polymers, their corresponding material and process fundamentals are discussed in this paper.

The basics of nowadays most common irradiation processes, which are

for continuous stranded products

- Single Beam, Rotary Technique
- Single Beam, Multiple Pass Technique
- Dual Beam, Multiple Pass Technique

and

- Single Beam, Single (Multiple) Pass Technique  
by means of a conveyor belt or cart system  
for discontinuous goods

are briefly adressed together with some typical examples for illustration.

Some comments on the (dis)advantages and the future economic optimization potential which EB processing technologies could provide to the respective polymer processing industries are presented with respect to material, accelerator equipment and related product handling hardware.

The future competitiveness of irradiation crosslinking technologies, which offer numerous advantages in comparison to conventional CV curing and silane crosslinking technologies, only can be maintained by increasing their economic attractiveness, which is: high processing speeds, high material throughput at low production costs and comparatively low capital investment of the hardware involved.

Other, more sophisticated irradiation process proposals found in the literature and respective patent publications will be briefly presented, although all of which lack more or less practical evidence for industrial economic and reliable application.

Finally, the authors vision of a more efficient, economical EB-process design, by combining quasi state of the art EB-equipment components with a novel beam deflection system to practically achieve an „Dual Beam, Four Side Crossfiring Process“ for continuous strand-products, will be presented.